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CONTENTS

ANNUAL GRADUATE FORTNIGHT. THE PROBLEM OF AGING AND OF OLD AGE. October 1 to 14, 1928	1
Relation of Endocrine Disorders to Senescence. WILLIAM ENGELBACH	1
Arterial Diseases of the Brain and Cord. FOSTER KENNEDY	19
Menopausal and Post-Menopausal Conditions in Women. BENJAMIN P. WATSON	25
Urology, its Contacts with General Medicine. JOSEPH F. MC CARTHY	38
Arthritis and Old Age. RUSSELL L. CECIL	52
Traumatic Surgery and the Problems of Age. JOHN J. MOORHEAD	66
Diseases of the Eye in Old Age. WILLIAM H. WILMER Special Aspects of Neoplasms in the Aged. JAMES EWING X-Ray and Radium in the Problem of Old Age. FRANCIS CARTER WOOD	76 101 105
Hypertension. HERMAN O. MOSENTHAL	107
Angina Pectoris. HARLOW BROOKS	108
Senescence and Rejuvenescence from a Biological Stand- point. CHARLES M. CHILD	111
Liver and Biliary Passages, FRANKLIN W. WHITE	113
Digestive Problems. THOMAS R. BROWN	117
<i>The Library</i>	
Catalogue of an Exhibition of Books, Etc., on Old Age	119
Recent Accessions	135
Proceedings of Academy Meetings	138
<i>Notes</i>	
Dates of Academy Meetings	143
Luncheon Announcement	143
Donations to the Library Funds	143
Death Notice	144
Index	144

CONTENTS

Editorial:

The Evil Spoken of Physicians and the Answer Thereto, FIELDING H. GARRISON.....	145
--	-----

ANNUAL MEETING, January 3, 1929

Address of the Retiring President

The Academy as an Educational Institution, SAMUEL W. LAMBERT.....	158
--	-----

Address of the Incoming President

The Academy, the Profession and the Public, JOHN A. HARTWELL.....	162
--	-----

A Study of the Streptococcus in the Etiology of Arthritis, REGINALD BURBANK.....	176
---	-----

A Clinical Index of Malignancy for Carcinoma of the Breast, BURTON J. LEE and JOHN G. STUBENBORD.....	188
--	-----

Resolutions Passed at the Stated Meeting of February 7, 1929.....	196
--	-----

Public Health Relations Committee

Report on Open Hospitals in New York City.....	197
--	-----

Committee on Medical Education

Second Annual Graduate Fortnight.....	211
---------------------------------------	-----

Recent Accessions to the Library.....	212
---------------------------------------	-----

Proceedings of Academy Meetings.....	214
--------------------------------------	-----

Fellows Elected January 3, 1929.....	220
--------------------------------------	-----

Deaths of Fellows of the Academy.....	220
---------------------------------------	-----

CONTENTS

The Skin as a Shock Tissue, ARTHUR F. COCA.....	223
Allergy in Skin Diseases, SIGMUND POLLITZER.....	232
Discussion: ABRAHAM WALZER, CHARLES MALLORY WILLIAMS and ARTHUR F. COCA.....	243
Serum Protection and Serum Treatment of Poliomyelitis, SIMON FLEXNER	252
Salpingitis, CHARLES E. FARR and ROBERT E. FINDLAY.....	258
Lung Abscess—Some Aspects of Etiology and Medical Treatment, JAMES ALEXANDER MILLER.....	268
Excerpts from the Minutes of the Council.....	274
<i>The Library</i>	
Recent Valuable Accessions.....	276
Recent Accessions	276
Catalogue of Medical Manuscripts and Incunabula....	278
Announcements	292
Proceedings of Academy Meetings.....	293
<i>Notes:</i>	
Catalogue of Art Exhibit.....	298
Notice	303
Deaths of Fellows of the Academy.....	303

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CONTENTS

Editorial:

Medicine as an Agency in the Advancement of Science, Art and Civilization, FIELDING H. GARRISON.....	305
The Serum Treatment and its Evaluation in Lobar Pneumonia, JESSE G. M. BULLOWA.....	328
To the Great Clinician Friedrich von Müller on His Seventieth Birthday, W. SCHWEISHEIMER.....	363
Osleriana, FIELDING H. GARRISON.....	365

Committee on Public Health Relations

Supervisory Powers of the State Board of Charities....	367
Resolution in Honor of Dr. Dana.....	375

Council Notes

Acknowledgment of Endowment.....	378
Acknowledgment of Donation.....	378
Medical Broadcasting	378
Resolution of the Council on the Death of Dr. Widal..	379
Recent Accessions to the Library.....	381
Proceedings of Academy Meetings.....	383
Fellows Elected March 7, 1929.....	389
Deaths of Fellows of the Academy.....	389

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CONTENTS

Editorial:

A Medical Tour in the West, FIELDING H. GARRISON....	391
Control of Conception, Present and Future, ROBERT L. DICKINSON	413
Preliminary Report of Oral B C G Vaccination in New York City, on Human Beings, CAMILLE KERESZTURI.....	435
The Centenary of Johann Nepomuk Czermak, DAVID BRYSON DELANAN	440
Modern Methods of Resuscitation in New York City, DANIEL J. DONOVAN	444
Committee on Professional Standards.....	457
Protection of Patients' Confidential Records.....	461

Committee on Medical Education:

Fourth Series of Afternoon Lectures.....	467
--	-----

Library Notes:

Library Hours During the Summer.....	468
An S. O. S. from Venice 380 Years Ago, ARNOLD C. KLEBS	469
Recent Accessions to the Library.....	471
Proceedings of Academy Meetings.....	475
Fellows Elected April 4, 1929.....	480
Deaths of Fellows of the Academy.....	481

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CONTENTS

Editorial:

Ramón y Cajal, FIELDING H. GARRISON.....	483
The Medicine of the American Indian, HARLOW BROOKS.....	509
Segmental Hyperalgesia and Segmental Increased Muscle Tone in Diseases of the Lungs and Heart, JESSE G. M. BULLOWA.....	538
The Importance of Early Diagnosis and Early Operation in Hemolytic Streptococcus Gangrene, FRANK L. MELENEY	552
New Vestibular Complexes for Localization of Brain Tumors, LEWIS FISHER	554
Unveiling of Memorial Tablet to Dr. Holt, ROYAL S. HAYNES	557
Meetings of Foreign Medical Societies.....	561
Second Annual Graduate Fortnight.....	562

The Library:

Library Hours During the Summer.....	563
Recent Accessions to the Library.....	564
Proceedings of Academy Meetings.....	570
Action of the Council.....	578
Fellows Elected May 2, 1929.....	578
Deaths of Fellows of the Academy.....	579



J. Ramon Cayal

CONTENTS

Anniversary Discourse:

What Medicine Can Do for Law, JUDGE BENJAMIN CARDOZO	581
The Rôle of the Medical Expert in Criminal Trials. FOSTER KENNEDY	608
Social Danger of the Borderline Mental Case, C. FLOYD HAVILAND	614
Medico-Legal Problems, JUDGE CORNELIUS F. COLLINS.....	631
Discussion: HON. WILLIAM McADOO and FRANKWOOD E. WILLIAMS	648
Second Graduate Fortnight.....	661

Library Notes:

Recent Accessions	662
Library Hours during the Summer.....	665
Obituary of John A. Mandel, W. C. MacTAVISH.....	665
Correction	667

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CONTENTS

Editorial:

Developmental Possibilities in Medical History as a Branch of the Medical Curriculum, FIELDING H. GARRISON....	741
The Common Affections of the Colon, their Origin and their Management, JOHN L. KANTOR.....	757
History of Post-Graduate Medicine in New York City, THOMAS JEFFERSON HARRIS.....	789
Second Graduate Fortnight.....	802

Library Notes:

Visioning Our Periodicals.....	803
Recent Accessions	805
Library Hours during the Summer.....	807
Obituary of Reginald Hall Sayre, ROBERT J. CARLISLE.....	807
Deaths of Fellows of the Academy.....	811

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CONTENTS

Public Welfare in Vienna, PROF. DR. JULIUS TANDLER.....	S13
The Genesis of the Medical Department of the United States Army, EDWIN P. WOLFE.....	S23
Allusions to Medicine in Classical Literature, FRED B. LUND.....	S15
<i>Book Review:</i>	
The Osler Catalogue, F. H. GARRISON.....	S60
Second Annual Graduate Fortnight.....	S64
<i>Library Notes:</i>	
A Volume on Deposit and its Owners, ARCHIBALD MALLOCH	S65
Among our Manuscripts, MISS GERTRUDE L. ANNAN...	S69
Recent Accessions	S72
Correction	S76
MEMORIAL ADDRESSES: Hideyo Noguchi,	
THEOBALD SMITH, WILLIAM H. WELCH.....	S77
Deaths of Fellows of the Academy.....	S86

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CONTENTS

Editorial:

The History of Drainage, Irrigation, Sewage-Disposal and Water-Supply, F. H. GARRISON.....	887
Allergy as Encountered by the General Practitioner, Wm. W. DUKE	939
Friday Afternoon Lectures 1929-1930.....	974
Recent Accessions to the Library.....	979
Elections to Fellowship.....	984
Deaths of Fellows of the Academy.....	984

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CONTENTS

The Wesley M. Carpenter Lecture:

The Importance of the Emotions in the Etiology and Prognosis of Disease, CHARLES P. EMERSON.....	985
Some Needs in Medical Bibliography, ARCHIBALD MALLOCH	1005
Notice	1013
Recent Accessions to the Library.....	1014
Proceedings of Academy Meetings.....	1017
Fellows Elected November 7, 1929.....	1022
Resolutions of the Council Adopted October 30, 1929.....	1023
Deaths of Fellows of the Academy.....	1024

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CONTENTS

ANNUAL GRADUATE FORTNIGHT. FUNCTIONAL AND NERVOUS PROBLEMS IN MEDICINE AND SURGERY, October 7 to 19, 1929.....	1025
Address of Welcome, JOHN E. JENNINGS.....	1025
The Graduate Fortnight, HARLOW BROOKS.....	1027
The Origin and Growth of the Mental Hygiene Movement, MR. CLIFFORD BEERS.....	1031
The Involuntary Nervous System, WALTER LANGDON BROWN	1035
Hysteria as a Practical Problem, C. MACFIE CAMPBELL	1057
 <i>Library Notes:</i>	
A Magnificent Gift of a Collection on Foods and Cookery, ARCHIBALD MALLOCH.....	1074
A Fellow's Special Fund, ARCHIBALD MALLOCH.....	1076
Recent Accessions to the Library.....	1077
Proceedings of Academy Meetings.....	1081
Resolution of the Council and Stated Meeting, December, 1929	1087
Deaths of Fellows of the Academy.....	1088
Notice of Index.....	1088

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V.

JANUARY, 1929

No. 1

ANNUAL GRADUATE FORTNIGHT

The Problem of Aging and of Old Age

October 1 to 14, 1928

RELATION OF ENDOCRINE DISORDERS TO SENESCENCE¹

WILLIAM ENGELBACH

Engelbach Clinic, St. Louis

*Life Duration and Expectancy of the Endocrinopathies.
Endocrine Senility. Relation of Endocrine Diseases to
Other Conditions Producing Senescence. Early Diag-
nosis. Preventive Endocrine Therapy.*

Physiology is that part of biology pertaining to the processes, activities and phenomena of living organisms. Modern conception of physiology concerns the phenomena produced by the various bodily activities. These activities are biochemic effects resulting from alterations in food-stuffs from intake to expulsion. The three primary physiological phases which deal directly with normal growth and development refer to those correlated functions performed by (I) the organs of *secretion*, (II) the organs of *incretion* and (III) the organs of *excretion*. The secretory organs in this sense are limited to the gastro-intestinal tract and its adnexa. These organs supply *secretions* through tubules. They have as their functional objective the reduction of complex food-stuffs to elemental, utilizable substances. These utilizable substances are absorbed from the gastro-intestinal tract to be used immediately or to be stored as reserve. The incretory organs, or en-

¹ Delivered October 4, 1928.

endocrine glands are ductless, and consequently furnish directly to the blood their *internal secretions*, or *incrctions*. These incrctions convert the utilizable substances (prepared by the secretions), into some form of energy for general use or specialized cellular activity. The conversion of stored glycogen into energy in the form of muscular contraction is a simple example of the function of the endocrine glands. Insulin has for one of its purposes the mobilization of glycogen in the liver. Through its action, if normal, the blood sugar is evenly maintained from 0.10 to 0.12 per cent. Adrenaline has among its many functions vasomotor constriction and *demobilization* of the stored glycogen. When demanded for consumption, adrenaline liberates from the liver into the blood an excessive amount of glycogen. Through visceral vascular constriction this hyperglycemic blood is rushed to the tissues. There with other utilizable principles the glycogen is transformed into specialized energy, muscular contraction, and energy for general use, in the form of heat. The third primary physiological phase has as its end-result the *excrctions*. This process consists in the collection by the blood of the tissue waste-products (resulting from the *incretory act*), their transference to the excretory organs for separation from the blood and their ultimate expulsion from the body. Cellular function of *other systems* of the body are intimately interwoven and coordinated with those effecting the processes of *secretion*, *incrction* and *excretion*.

The second phase of this triad of physiological processes, that referable to the function of the *incretory organs*, is the most vital and essential. Contrast the specialized attainments of the conversion of inert, basic substances into energized physical and psychic activity, with the simpler chemical processes of the preparation of utilizable substances and the elimination of waste products. Endocrinology, the study of the *incrctions*, for this reason is the most vital of physiology. The endocrine system is the keystone of the completed physiological arch builded by this function.

tional triad. The biological effects of the *internal secretions* are the peak of this physiological phase.

Incretory function, however, is not limited merely to the act of converting utilizable substances into energy. The endocrine glands not only sustain the two allied functional mechanisms of this triad, but by unison of incretory action afford *generalized energy* for the *protection* of the *bodily harmonics* and through *specialized cellular activity* maintain specific functions of *all other systems*. With the aid of the autonomic nervous system their harmonic interaction almost independently regulates their own functions. The individual glands of the *secretory* organs are dependent upon the chemical messengers of the ductless glands for *their* activity. For instance, the internal secretions have a decided influence upon the motility, as well as upon the activating enzymes and chemical secretions, of the gastro-intestinal tract. In turn, the involuntary processes of the organs of *excretion* rely almost wholly upon incretory function. A gross example of the production of energy for generalized usage is their creation of heat as a protection against thermogenic changes or mechanical injury. Bodily temperature reaction to the invasion of bacteria or toxins is an evidence of the role of the endocrine glands in the production of immunity. Involuntary muscular action (cardiac, respiratory, intestinal) is normally provided by them. Specialized energy, resulting from specific cell activity, relates the function of the endocrine organs to other vital systems of the body, such as the nervous, cardiovascular and reproductive. These depend upon the internal secretions for their individual cellular activity, the correlation of which is necessary for the projection of the functional objectives of their entire systems. Incretory relation to the central nervous system governing voluntary acts is well demonstrated by voluntary muscle tonus. Musculo-osseous overgrowth and muscular *strength* of gigantism accompany *hyperactivity* of the anterior lobe of the hypophysis. When, however, this lobe manifests a transition from *hyper-* to *hypoactivity*, general muscular weakness is so extreme as to make

it difficult for the patient to stand alone or, in some instances, to raise his arm. In this condition, although normal volition demands contraction of the voluntary muscles under its control, there is a lack of response to the higher centers of the central nervous system. Muscular, as well as mental exhaustion is a common symptom of all endocrine deficiency, hence the generic term "*endocrinasthenia*." Absence of anatomic development of the central nervous system has been found in those individuals who have had embryonically a hypoplasia of the cortex of the suprarenal gland. Myxedema depicts abeyance of the mental activities of the central nervous system *after* it has functioned *normally* for many years. On the other hand, the endocrine system is under the domination of the central nervous system. The correlation and interdependence of these two, as well as their interdependence with other systems, is consistent with accepted knowledge of endocrine effect upon all cellular activity. Without the central nervous system, endocrine activity could not be performed, yet its involuntary acts of motility and secretion continue during sleep and coma. The continuance of these involuntary activities for a considerable time, even after all faculties contingent upon the central nervous system have ceased, is probably due to interaction of the hormones which automatically provide for the functions of their own glandular system.

No brief is necessary for the far-reaching physiological role which the internal secretions fulfill. Yet it is true that science must bridge many open gaps of hormone action. Clinical and morphologic studies of endocrine disorders, aided by investigation of the allied medical sciences have advanced their biochemic problems far beyond the realm of speculation and empiricism to a scientific basis of fact and practical clinical application. Modern physiology has dignified the scope of glandular activities to a wider concept than that affecting the thyroid and gonads. Easily obtainable, lucid information clearly indicates their pathogenic relations to premature senility. Physical and mental development consistent with the age of the in-

dividual, is dependent largely upon the harmonious action of the entire endocrine system. This state of endocrine activity produces a delicately balanced perfect equilibrium of the internal secretions. Abnormalities of incretory function create individuals disproportionately precocious, premature or retarded for their age. This may be due to uniglandular or pluriglandular disorders of over- or under-function. Marked variation in any direction, inconsistent with normal development for the age is effective, directly or indirectly, in modifying the life duration and expectancy. A modification of metabolism as induced by these factors, is not only responsible for transient abnormalities, but also affects longevity. In addition to the relationship of glandular disorders to presenility and senescence, *what is most significant* is that they are responsible for more incompetency and delinquency than are chronic diseases of other systems.

The purport of this paper is to emphasize *early diagnosis* and *preventive treatment* in endocrine disorders as means of averting presenility. The basis for such discussion has been the exhaustive clinical study of over 6,000 endocrinisms, many of whom have been observed over a course of eight to ten years. It is necessary here to define what is considered a pure endocrinism. This is one in which, first, non-endocrinous diseases are excluded; and, secondly, positive endocrine disorder, sufficient to account for the symptomatology, is included.

With the exception of Addison's disease and malignancies (hypernephroma, primary carcinoma and sarcoma, endothelioma), the mortality in disease due *primarily* to incretory disorder is exceedingly low. The theory that death in many infections (such as pneumonia and diphtheria), as well as in intoxications (chloroform, cocaine), is due to acute endocrine deficiency, is not accepted; consequently, does not alter the following deductions. The lessened span of life of the endocrinopath is usually due either to reduced immunity to extrinsic diseases, or to marked changes in other systems, predisposing to degenerative lesions of premature old age. In general,

it may be stated that the life expectancy is very much longer than in chronic disease of the nervous, cardiovascular or respiratory system. In non-malignant endocrinisms, therefore, the prognosis is usually good with regard to duration, but in those occurring in later decades of life, in which a number of glands become involved, the average expectancy does not equal that of the non-endocrinous individual.

There is considerable misconception in the medical mind regarding the curability and, more important, the preventability of many of the well-known endocrine disorders. A review of therapeutic results in 1,000 endocrinopaths who had been under observation for more than five years proved contrary to contemporary estimation. Good results, defined as a complete relief of symptoms, with restoration of normal capacity, were obtained in nearly 35 per cent. of cases. Bearing in mind that comparatively few were diagnosed within five years of onset, that many had a biglandular or a pluriglandular disorder at first observation and that nearly all were beyond the age of twenty (most of them beyond thirty), these results compare favorably with those in chronic diseases of other systems. The curability of these disorders, however, depends upon a number of factors: (1) The age of the patient; (2) the number of endocrine glands involved; (3) the state of activity of the gland, or glands; (4) the duration of the disorder; (5) the specificity of medical or surgical treatment; and (6) secondary or additional involvement of other organs or systems.

Morbidity due to ductless glandular disorder causes more human distress and economic waste than do other chronic systemic diseases. The limitless number of psychopaths and of backward or feeble-minded children originating primarily in endocrine disorder, is appalling. The untold amount of physical or mental defectiveness and delinquency from incretory imbalance, if actually known, would startle the imagination. Deductions are not to be drawn that all defectiveness is of endocrine origin. That a considerable amount is, and of this, probably 50 per cent.

could have been prevented, is a point of alluring interest. The astonishing number of human beings partially incapacitated or reduced to a state of incompetency and dependency upon family or state, measures the amount of actual economic waste entailed by these endocrine disorders. The effort presented in the field of preventive medicine to forestall *juvenile* defectiveness and incompetency is much more important than preventing the premature senility of midlife. Incomparably, this should be a more effective means of retaining juvenility than is offered by the strenuous attempts at rejuvenescence.

Glandular Activity. The rapidity with which functional endocrine disorders *advance* age depends upon the type of activity of the disordered gland. The thyroid, whose activity can be precisely measured by the basal metabolism, offers the most obvious example of retardation or prematuration of normal activities through endocrine influence. Thyrotoxicosis, with its stimulation of cellular activity in all systems, including the endocrine, if severe and unchecked even for a comparatively short duration, produces irremediable damage, particularly to the cardiovascular system. Thyroid deficiency, on the contrary, with its concomitant lowering of basal metabolism, is less acute and more prolonged in course. Owing to its inhibition of the cardiovascular and nervous systems, myxedema is characterized by a disability resulting from retarded mental processes. Acquired myxedema during juvenility results in a classical presenility before the age of twenty. Early aging as induced by other ductless glands whose functions cannot be measured so accurately as that of the thyroid, is reflected largely in signs and symptoms referable to other systems. Preadolescent deficiency of the *posterior* lobe of the hypophysis exhibits a juvenile adiposity. This obesity, if untreated, continues into adult life, when the thyroid gland usually becomes secondarily inactive. This biglandular disorder produces the enormous, frequently unrelievable obesity characteristic of concurrent inactivity of both these glands. In addition to causing a physical debility,

this adiposity unnecessarily taxes the cardiovascular competency.

Marked disorder, either hypo- or hyperactivity, of the *anterior lobe* of the pituitary gland affects principally the osseous and genital development. Except in acromegaly and gigantism, this glandular imbalance causing deforming osseous changes has relatively little influence upon longevity. The secondary gonadal disorder materially affects the marital relation, involving the menstrual epoch and procreative function. Anterior lobe pituitary disorders, either directly or through the medium of the gonads, are productive of extreme psychopathic complexes. These may be so severe as to be mistaken for primary psychoses. Primary genital hypofunction psychically affects the two sexes differently. In the male, *the psychic reaction*, related to general incompetency more than to longevity, is the most distressing manifestation. After adolescence, the absence of sexual characters in the male, associated with extreme shyness and a want of initiative and projection, tends to dissociate the subject from the ordinary activities of life. In the female, the undeveloped primary and secondary sexual characters is not so decided a handicap. In some instances, it apparently acts to the contrary, producing the "masculine female," a competitor of male workers in many occupations. This aggressiveness is pertinent provided the secondary reactions, gastro-intestinal, cardiovascular and nervous (in their sequence of occurrence), are not incapacitating. In early female hypogonadism, the gastro-enteric symptoms are often so severe that, in a group of 200 cases (eunuchoids as well as castrates), more than fifty had undergone at least one abdominal operation for suspect primary gastro-intestinal lesion. Some of these had submitted, without relief, to as many as six abdominal operations. Intractable vomiting had persisted in some instances for a duration of five to fourteen years. The cardiovascular manifestations of this group are tachycardia, vasomotor flushing, palpitation and the complex designated as "*neurocirculatory asthenia*." The nervous symptoms ordinarily are diagnosed as "neurotic," "neurasthenic."

"psychoneurotic," etc. It is to be noted that in this class sensory disturbances involve the mucous membranes of the gastro-intestinal tract and bladder as much as the integument. Involuntary muscle action, particularly gastro-intestinal and respiratory, is affected. A decreased gastro-intestinal motility and modifications in secretion, in conjunction with the abnormal visceral position in the enteroprotic abdomen, undoubtedly account for the gastro-enteric symptoms. Sighing respiration, sometimes even an objective dyspnea, and marked susceptibility of the respiratory tract to chronic infections, as tuberculosis, are among the respiratory symptoms. Hypogonadism has regional and dermal signs inconsistent with the age. The youthful, childlike facies of the ateliotic woman of postadult age is significant. An early soft, velvety, and later parchment-like, wrinkled skin is characteristic of hypogonadism. The aging process due to arteriosclerosis and secondary infection, gangrene, etc., in diabetes mellitus is well known, as is its relation to adiposity, with the consequent cardiovascular strain.

Hypergenitalism is a sign of primary disorder of some endocrine gland *other* than the gonads, most probably the suprarenal cortex or the epiphysis. These cases group themselves clinically into (1) those associated with hypertrichosis (supposedly related to suprarenal cortex function), and (2) those without a preadolescent trichosis or an increased postadolescent hair growth (possibly pineal in origin). Both these varieties of pubertas precox exhibit a macrogenitosomia. In both sexes, sometimes natal, always prepuberal, there is a precocious anatomical and functional genital development. Sooner or later in both sexes, definite symptoms referable to the nervous system develop. These vary from mild functional nervous disturbances to epilepsy and apparent true psychoses, simulating dementia precox. This disorder furnishes a most striking example of endocrine imbalance causing a projection of genital development many years in advance of other systems. The overspecialization of the genital system consequent to this incretory

disorder contrasts with the mental defects of the nervous system.

Early signs of endocrine aging appear in the skin, mucous membranes and retina. Those of the skin refer to its texture, pigment and appendages, the hair and nails. Variation from a soft, velvety dermal texture to a parchment-like atrophy in the hypogonads, and the hypertrophy and subdermal infiltration in myxedemas, have been mentioned. Chronic eczemas and dermatitis, with a persistent, intolerable pruritus, are common in hypothyroidism. Urticarias, erythemas, hyperesthetic rhinitis, hay-fever and asthma, if endocrinous, are most likely related to calcium deficiency of the parathyroid group. The work of P. E. Smith, B. M. Allen and W. J. Atwell has definitely associated an isolated overdeposition of pigment (chloasma) and a complete absence of pigment (vitiligo) with the hypophysis. Retinitis pigmentosa and albinism may have this source. Characteristic abnormal hair growth distributions are principally associated with gonadal and suprarenal cortex disorders. Localized marginal scalp alopecia is usually the accompaniment of thyroid deficiency. Early vertex alopecia so frequently occurs in pituitary deficiency, with relief by substitution of pituitary hormone, that this etiology should be suspected. Generalized atrichosis most often results from pluriglandular deficiency. Two of five cases who had had a total absence of hair for over a year experienced a restoration of hair growth without treatment, indicating that the prognosis in generalized atrichosis is more favorable than in localized alopecia.

Endocrine disorder affecting calcium metabolism has a direct relationship to lesions of other systems associated with senilism. The incretions definitely known to influence *calcium metabolism* are those of the parathyroid and thyroid glands. Calcium derived from food is stored almost exclusively in the bones. The illuminating work of Joseph C. Aub has demonstrated that the storage, mobilization and excretion of calcium is dependent primarily upon parathyroid function, and secondarily upon the thyroid

and probably other hormones. It was also shown that ammonium salts help to sustain the calcium balance in those who are inclined to calcium deficiency. It is interesting to note from his work that in tetany comparatively little relation exists between the *blood calcium* curve and *calcium balance* (the difference between intake and output of calcium). With this interpretation, nearly all deductions based upon the *blood calcium* must be modified. Among calcium deficiency diseases of the younger ages are the spasmophilias, of which infantile tetany, laryngospasm, spasmodic croup, asthma, convulsive and epileptiform attacks are types. In the adult also, calcium metabolism is a factor in various forms of tetany, parathyroid, gastric and intestinal. Vasomotor disturbances and other dermal diseases, particularly urticaria and erythema, are frequently accompanying signs of calcium deficiency. To this etiology has been credited chronic ulceration of the stomach and leg, as well as a definite relationship to the "acid base balance" in acute diseases terminating in "acidosis" or "alkalosis." Its direct connection with early senility is due to calcium deposit in various degenerative lesions of other systems. Atheroma, arteriosclerosis, otosclerosis, chronic arthritis and divers other retrograde changes occurring in midlife have various states of calcification as a part of their histopathology. The immunity and curability presented in the calcification of chronic lesions, as in tuberculosis of the lymph glands and lungs, offer a virgin field for further incertory investigation concerning calcium metabolism in the general subject of immunity.

Important secondary conditions due to endocrine disorder predisposing to early senility have been mentioned in their various glandular relationships. Of special note are abnormalities in *blood pressure* having no *cardiovasculorenal* basis. In a review of 500 uncomplicated endocrine disorders (1920), having no other *cardiovasculorenal* manifestations, it was found that 10 per cent. had shown a systolic hypertension of 160. or higher. More significant than endocrine *hypertension* is a *hypotension*, often 20 to

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30 mm. below the normal reading for the age. This *hypotension* occurs in approximately 25 to 30 per cent. of endocrine disorders. Both hyper- and hypotension are related to endocrine *imbalance*, rather than to a disorder of any gland or combination of glands, or a single state of glandular activity. In general, abnormal blood pressure changes having no pathological basis are probably endocrinous. It is probable that the large majority of so-called *essential hypertension*s are due to incretory imbalance. The present inclination to attribute this type of hypertension to heredity is probably not far-fetched. Knowing the tremendous influence of heredity upon constitutionality through endocrine transmission, we may concede that its studies *do* help to explain many of these vascular hypertensiones. Here again, emphasis must be placed upon early diagnosis, to prevent the propagation of just such untoward inherent tendencies by opportune correction of their incretory cause.

Early Diagnosis. The treatment of premature senility should be *preventive*. This is dependent upon early diagnosis. As heredity is the prime etiological factor pertaining to ductless glandular imbalance, the removal of this predisposing influence should be given utmost attention. The probability of modifying its influence in many endocrine disorders presents a fruitful and productive field in preventive medicine. For this reason, it is necessary to make a searching study into the genealogy. Investigation relative to endocrine syndromes should apply to the parental and ancestral history, and the clinical indices to endocrinism should be sought in the gravid woman, the infant at birth and during the infantile, juvenile and adolescent ages. After conception, the gravid woman should be observed closely for failure of endocrine response to the additional demands of pregnancy. Functional response of the thyroid after the second month of pregnancy, we believe, can be definitely measured by serial monthly basal metabolic tests. Following the second month, the basal metabolic rate should be above normal, ranging from +15 to +25 per cent. In gravid women in whom this

increased rate does not prevail, the thyroid is considered as *not* furnishing to the mother or embryo sufficient thyroxin to provide for the mother's increased endocrine demands or to supply a normal fetal metabolism and development. Other clinical evidences of thyroid disorder during gestation are a diffuse enlargement of the gland, facial puffiness, supraclavicular and dorsal padding and toxic symptoms of pregnancy (nervousness, nausea and vomiting, albuminuria, abnormal blood pressure, etc.). The effect of a lowered metabolism upon the fetus is an increase in size, producing overweight at birth, which is a danger during delivery to both mother and child. More important is the failure of development of the nervous system during embryonic life, with its tragic postnatal retardation of mentality. Treatment of the mother during pregnancy should aid in preventing congenital hypothyroidism.

The next opportunity for early diagnosis of congenital hypothyroidism is at birth. Roentgenographic studies of the osseous system have demonstrated that at birth the *normal* infant has the following osseous nuclei present: lower epiphysis of the femur, upper epiphysis of the tibia and two tarsal bones (talus and calcaneus). Routine X-ray examination of the knee and ankle of the infant at birth would indicate, through its ossification, a possible hypothyroidism, and whether or not its nervous system had been properly unfolded during intra-uterine life.

The first year's chronological development is the next indication of congenital hypothyroidism. Early manifestations of this condition are as follows: (1) Overweight at birth (more than 8 lbs.). (2) Late separation of the cord (after the second week). (3) Failure to support the head unaided after the fifth month. (4) Delayed dentition (after the seventh month). (5) Delayed walking and talking (after one year). Following the first year, hypothyroidism concerns statural growth and mental progress from infancy to adolescence. A latent, or potential, hypothyroidism may present a transient *decreased* thyroid

function under many common forms of stress and strain. Adolescent colloid goiter, though most often self-curative, should be a danger signal indicating that the thyroid function might not later respond to additional demand, such as imposed by infection, intoxication, extreme emotionalism and maternity. Adolescent goiter preceding conception thus enhances the possibility that the offspring might be overweight at birth and have the mental incompetency of congenital thyroid deficiency.

For early diagnosis of pituitarism, the ancestral and parental history should be elicited with reference to clinical entities such as gigantism, acromegaly, pituitary tumor, girdle adiposity, Froehlich's syndrome and Lorain-Levi disorder. Isolated complexes referable to menstrual disturbance, headaches, epilepsy (pituitary type), diabetes insipidus and hypophyseal glycosuria should be a warning as to hereditary transmission. Pregravid clinical signs of these syndromes, which are usually exaggerated by pregnancy, should be determined. The pituitary infant frequently has a precocious eruption of the teeth. The lower incisors appear as early as the second to the fifth month, instead of at the sixth or seventh. Pituitary children are never mentally retarded. Ordinarily, the first gross evidence of hypopituitarism is not presented until juvenile life. *At this age epoch, juvenile obesity is a positive sign of inactivity of the hypophysis.* So few associated symptoms exist that these juvenile adiposities are in many instances disregarded. They rarely receive treatment until after adolescence, when a failure of sexual development is noted. In the male, the external genitalia are definitely aplastic. In the female, the aberrant genital function is evidenced in amenorrhea, metrorrhea and dysmenorrhea. In gonadal deficiency, there is a delayed epiphyseal fusion, with consequent long bone overgrowth. Comparative tabulations of the normal ages for epiphyseal union have been an aid in the prepuberal diagnosis of such disorder. The most suggestive sign of hypogonadism, a rapid prepuberal long bone overgrowth, produces an abnormally tall stature. There is a coincident lack of development of primary and

secondary sexual characters. In the male, cryptorchism and external genital aplasia are readily diagnosed by inspection and palpation. Delayed, decreased menstruation occurs in the female. *Hypergenitalism* manifests a prepuberal development of primary and secondary sexual characters, with precocious somatic changes and, in one group, a hypertrichosis.

Preventive Treatment. Amenable endocrine disorders in both parents should be treated before conception. Marriage centers have been organized in Germany for the purpose of counteracting the propagation of these and other degenerative manifestations.

Hypothyroidism. It is essential to treat the *endocrinous* gravid woman, particularly if afflicted with a disorder so remediable as hypothyroidism. Thyroid extract sufficient to maintain the basal metabolic rate at from +15 to +25 per cent. should be administered during the entire term of pregnancy. A smaller dosage should be continued during lactation, as by this method the infant will receive thyroxin through the mother's milk. In addition, direct substitutional treatment to the hypothyroid infant should begin soon after birth. This consists of powdered desiccated thyroid gland given in some suitable infant food. The entire daily amount is given in one nourishment instead of in fractional dosage. The initial dose for a positive thyroid deficiency at birth should be not less than gr. 1 (0.06 gm.) daily. Ordinarily, this should be increased by gr. $\frac{1}{8}$ (0.0075 gm.) every six weeks until the infant is a year old. At the end of the first year, the child should be taking a daily amount of at least gr. 2 (0.12 gm.). Unless a metabolic chamber is available, the only reliable index to the maximum tolerable dosage is the rectal temperature. The mother is instructed to obtain the range of rectal temperature by making and recording estimations twice daily. A rise of more than one degree in temperature range is considered sufficient to withdraw the thyroid treatment for a few days, in order to determine whether maximum tolerance has been reached. After withdrawal of the thyroid

medication, if no other cause, such as gastro-intestinal upset or infection, for the abnormal temperature is discovered, the dosage causing the temperature elevation should be reduced by gr. $\frac{1}{8}$, and continued for six weeks, when an increase of gr. $\frac{1}{8}$ should be again attempted under the same guidance. Between two and four years of age, the hypothyroid child will ordinarily require gr. 2 to $2\frac{1}{2}$ of desiccated thyroid gland. After five to six years, the dosage should not exceed gr. 4 to 5 daily. A decrease in dosage, or a complete withdrawal of treatment, may become necessary, depending upon the course. The osseous development, as shown in serial radiograms of the growing nuclei, and an improvement physically and mentally, are general guides indicating the efficacy of treatment. Marine's prophylactic treatment to school children for thyroidism should be uniformly adopted on entrance to public schools at the age of five to six. This consists of sodium iodid gr. 2 once daily for two weeks, twice a year.

After the age of four, *pituitary treatment* may be indicated in addition, as the congenital hypothyroid usually acquires an insufficiency of either the anterior or the posterior lobe, or of both lobes, of the pituitary gland. The engrafted pituitary deficiency presents a non-obese (anterior lobe) or an obese (posterior lobe) type of cretin. The anterior lobe, or non-obese, type has a more retarded osseous and genital development than does simple hypothyroidism. In the *non-obese* cretin, in addition to thyroid therapy, extract of the anterior lobe pituitary gland, $\frac{1}{2}$ to 1 c.c. *intramuscularly* two to three times weekly, has been an efficacious adjunct. In *obese* congenital hypothyroidism, the hormone of the posterior lobe pituitary to the "intestinal reaction" is given. The initial dose is 2 to 3 minims of extract of posterior lobe intramuscularly. This is raised by 1 minim each dosage to the amount productive of *abdominal cramping* and *defecation* within twenty minutes after the injection. The "intestinal reaction" is considered as the index to the maximum tolerable dosage of this hormone. This dosage should *not* be exceeded, and is maintained until clinical improvement is obtained. Ordinarily,

two to three hypodermic injections weekly are sufficient, although the maximum dosage may be given twice daily, if necessary. The conspicuous therapeutic reactions are the weight reduction, redistribution of adiposity and improved mentality.

Pregnancy should not contraindicate operation for relief of hyperthyroidism. In fact, if thyrotoxicosis is not controlled by other means of treatment, surgery is imperative. The thyroid intoxication is more harmful to both mother and infant than the possible effects of subtotal thyroidectomy.

Hyperpituitarism, due either to tumor or to functional hyperactivity of the hypophysis, is best treated by Roentgen ray to the pituitary gland. This is more urgent in the event of pregnancy. Hypopituitarism demands hypodermic administration of pituitary extract from either or both lobes, as previously described. The descent of the testicle in infantile cryptorchism apparently is facilitated by giving desiccated thyroid. This is probably more effective in congenital hypothyroidism with cryptorchism than in the non-thyroid child. Preadolescent hypogonadism in the male is favorably treated in *some* instances by the hypodermic administration of extract of the anterior lobe of the hypophysis. Orchic extracts and substances have been found inert. Ovarian substance is given hypodermically in positive hypogonadism in the female, even in the preadolescent age.

The most effective treatment for calcium deficiency is obtained from a review of Aub's work. Administration of Collip's parathyroid hormone in tetany in a state of coma or convulsions restores the calcium balance, so as to relieve temporarily, the serious clinical manifestations. Aub has shown, however, that this increase in calcium mobilization is not maintained by parathyroid hormone longer than four or five days. After this time, excessive dosage of this hormone does not raise the calcium metabolism or prevent recurrence of clinical symptoms. Desiccated thyroid substance and ammonium chloride given orally will maintain

the calcium balance for a rather prolonged period. For this reason, these should be used as auxiliary treatment in any calcium deficiency. Desiccated thyroid gr. 3 to 5 daily and ammonium chloride gr. 5 to 10, three times a day are considered the average dosage. Calcium solution 10 per cent., in dosage of 10 to 20 c.c. intravenously, is usually sufficient to relieve post-operative tetany temporarily, and often permanently. Calcium lactate or calcium chloride, dr. $\frac{1}{2}$ to 1 three times daily, is usually exhibited. Owing to its insolubility when given orally, smaller doses have little value. The treatment of acidosis or alkalosis as a terminal state in various severe, acute medical or surgical conditions, on the basis of calcium balance, is certainly worthy of consideration. The effect of calcium balance upon the acidity or alkalinity of the blood as related to the prevention or cure of gastric or leg ulcer, should also be borne in mind. The *early correction* of all calcium deficiency types of spasmophilia, asthma and urticaria might have some bearing in adult calcification, such as is present in arteriosclerosis, otosclerosis and arthritis.

It is questionable whether, with the exception of thyroid substance, the desiccated substances from the various *endocrine glands* have any effect when given orally. Ordinarily in these cases, the desiccated powders of other endocrine glands are given by mouth, in addition to the hypodermic medication. They have no deleterious effects, and possibly are helpful in recent mild hypo-endocrinism. At present, there is no effective treatment for the various types of *hypergenitalism*. Treatment for diabetes mellitus in infancy is too well known to require special comment.

CONCLUSIONS

(1) Endocrine disorders promote presenility mostly through their degenerative effect upon other systems.

(2) More important than this predisposition to senilism is *their production of human incapacity and incompetency*.

(3) Early diagnosis, pregravid, prenatal and natal, is possible in many endocrine disorders.

(4) Preventive *endocrine* treatment is a most fruitful medical field in incertory defectiveness, delinquency and presenility.

ARTERIAL DISEASES OF THE BRAIN AND CORD¹

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All cells in the body can multiply and reproduce with the exception of those in the nervous system. These only are laid down in the embryonic life and growing as the individual becomes adult stretch out their processes in every organ and area of the body. When maturity of age has been attained, they no longer grow. They never reproduce themselves. Under these conditions, it follows that of all cells they are of necessity most long lived, but also of necessity they must alter with the changing condition of the entire organism. Some die long before their owner, and massive atrophy of the neural parenchyma is probably the most outstanding characteristic of the senile brain. However, one must emphasize that senility of structure is not produced by great age only; no individual over seventy-five is without alteration of brain tissue, but many persons twenty years younger have diffuse lesions in no way different from those of utter senility. Indeed, any severe infection or intoxication is capable of giving rise to cellular changes in the brain indistinguishable from those found in persons sorely stricken in years. Such infections act not only on the cells of the brain, but on the cells and fibres of nourishing blood vessels and by the devascularization thus produced secondary nerve changes are set up.

This change in blood vessels is altogether too causatively associated in our minds with the idea of age; much more should we think of it as due to all the infections and intoxications to which the body has been exposed throughout life. Such attacks have usually had but ingravescient and insid-

¹ Delivered October 3, 1928.

ious results and only after many years are these results made manifest in clinical symptoms and anatomical change. Therefore, in the majority of cases arteriosclerosis only appears in old age, but it is a product of many decades and we can all call to mind children and youths with arteries, as the saying is, of an old man. We are entirely too prone as a profession, to regard our current methods of research as ultimate and decisive and so to consider that no infection or intoxication exists in an individual if we have been unable to find it. By the same token psychiatrists too often assume a mental disease to be functional, "tooted in the mind," having a pathology in the lambent ether, a morbid process suspended somewhere, like Mahomet's coffin, between earth and heaven, for no better reason than that with our as yet crude methods, we have failed to find notable alteration in brain tissue. Let us remember for instance that only twenty years ago or less, Parkinson's disease was called functional, a neurosis, though we now know it is dependent on very precise changes in the cells of the lentiginous nuclei. So far are we from having reached an ultimate Thule in knowledge or technique that we must recognize that we have but lately embarked on our voyage of discovery.

As yet almost no progress has been made towards increasing the span of individual life. However, recognition of the fact that arterial degeneration is not the sure result of the inescapable years, but is a product of infections and intoxications occurring in those years, gives us a lively hope that Medicine may yet succeed in making life long by making life healthy. As man is conquering the foes in his environment, he may be trusted to conquer those within himself. In the meantime, however, arteriosclerosis is being manufactured in us poor ignorant ones, seldom in a generalized fashion, more often as localized lesions. Often advanced cerebral arterial change can be detected in persons lacking any sign of arteriosclerosis elsewhere, and the reverse situation also is found. Changes in the vessels of the brain give rise to a chain of focal lesions—areas of cerebral softening which are so often fatal. Such large

lesions are seldom primary. Long standing cerebral defects are always found whereby vessels are deteriorated and parenchyma made friable, atrophied, vacuolated; such alterations may not produce remarkable clinical symptoms, but they make almost inevitable a death by cerebral accident.

The senile brain is characterized by an amazing reduction in mass; the brain is retracted from the skull and from the membranes which are themselves often no thicker than tissue paper, and in which are frequently occurring osseous plaques. The meningeal vessels are spaced and small. The convolutions are thin and divided by deep sulci of greater size than the convolutions they surround. The convolutions are granular and wrinkled, and, most mysterious of all these conditions, the posterior third of the brain may be almost normal. We have no theory even on why the changes wrought by intoxications or old age should so persistently choose the frontal and parietal situations, but then we don't know why diphtheria should first strike part of the 3rd nucleus, why poliomyelitis should so avoid the posterior spinal horns, why encephalitis should be almost confined in lesions to the basal ganglia, or for that matter why tuberculosis should make a bilateral destruction of the adrenal bodies. Here again we need knowledge on infections and the forces which determine their paths of invasion.

The ventricles are always dilated in the aged, due less to increased cerebrospinal fluid than to the mass reduction already described which may reach 200 grams by weight. The corpus callosum as one would expect is slight, and is usually but a third its normal adult size—a reduction in association tracts which is not unrelated to the fading memory power of the aged. The cerebellum is affected though to a less degree than the frontal lobes; one case of reduction in cerebellar mass by two-thirds of its bulk has come under my observation, a man 82 with progressive bilateral cerebellar ataxia accompanied by intense general emaciation.

The nerve cell degeneration has been made especially clear by the use of Nissl's stains and the newer reactions of Ramon y Cajal and Hortega. The cells of the cortex are reduced in number showing that many have vanished utterly. Others, alongside healthy cells, are atrophic, pigmented or have undergone fatty degeneration, with increased production of neuroglial nuclei.

The large vessels are always atheromatous, especially those of the Circle of Willis. The smaller intracerebral vessels seldom lack lesions of different degrees of incidence, characterized by proliferation of the inner coat with shrunken lumen. Perivascular leucocytosis is the rule. Occasionally there is sclero-hyalin degeneration in which the entire wall is changed into a homogeneous hyalin mass, and again calcareous deposits and fatty degeneration may occur in the smaller capillaries.

Small focal lesions in cerebral tissue, some of microscopic size, are found as the result of vessel obliteration: as has been said these disseminations always precede the large focal lesions which produce paralysis and other easily recognized symptoms. Indeed, foci of military softening are often found scattered below the cortex, and these may be found side by side with perivascular gliosis. In the brains of persons who have suffered a senile dementia or even a number of transient cerebral palsies it is common to find lacunae with irregular walls containing granular debris or red blood cells.

It is uncertain whether senile dementia should be called a disease of the cerebral parenchyma or the cerebral vascular system. However, as our consideration of the morbid structure has just shown, it is almost impossible to divide the influences of the two associated deteriorations. The aged suffer a reduction in mental and physical power—there is an especial poverty in the faculty of creative imagining—many old people of genius or even talent have done mighty work—Titian, Michelangelo, and Voltaire come at once to the mind—but rarely do they create a new style, evolve a method different to that of their adult ma-

turity--old men of genius may soar magnificently on the Pegasus of their conditioned reflexes, but never do they find fresh horses! The person becoming senile has a loss in memory and especially for those memories most recently acquired. A loss of memory for nouns is pronounced and for proper names in particular, probably owing to the few associations united to such memories. He grows more and more egotistical and irritable. Somatic sensations especially from the gut play an increasing part in his mental and emotional life, and this increasing attention to his internal workings depresses his faculty of attention for his environment. Judgment is passed, therefore, on facts poorly received, suspicion is aroused and a sense of umbrage and persecution developed. The avarice of the aged is a return to the acquisitiveness of the young child, the whole mental life undergoes devolution so that nursery rhymes long forgotten may be the sole articulated product.

During this process in its beginning the senile is not without insight into his condition, he is forever on the defensive and talks jargon carefully to conceal his memory defects. His automatism sustains his front and sometimes cross examination exceeding the bounds of courtesy is needed to reveal the underlying poverty of ideas, attention or memory. Associated with these psychical alterations there is often vertigo, which may well be the result of true cerebral intermittent claudication, insomnia by night and sleepiness by day, transient apoplectiform attacks or short epileptic seizures with fleeting attacks of aphasia.

In the early stages, the patient is merely slowed up in his reaction time, enfeebled in his power to grasp abstract ideas and acutely aware of his condition. He fears insanity and complains of bagatelles. It should be stated here that certain cases of cerebral arteriosclerosis are indistinguishable by symptoms and almost so by autopsy from cases of general paralysis--the Wassermann reaction in the cerebrospinal fluid in such difficulties offers the only clue to correct diagnosis.

Apoplexy or severe cerebral thrombosis with retention of life and partial recovery and contracture are seen in the adult of late middle life—not in the aged. And for the simple reason that large lesions of destruction are usually fatal to the very old. That is not to say that hemiplegias of vascular origin cannot affect old people; they do, but the attack is less fulminant and the symptoms tend to regress. The hemiplegias of the old are less likely to be due to a blood effusion than to the breaking down of a lacuna in the brain. Pierre Marie warns us to be careful to avoid favorable prognoses in these lacunar hemiplegias; they depend for their production on diffusion of lesions in lacunar brains, which Marie describes as *vermoulé*—worm-eaten. The patient rarely falls unconscious in an attack, he gets dizzy and notices his hand and leg, or both, weaker and clumsier than usual, or he experiences notable difficulty in speech, a fleeting dysarthria. These symptoms improve and he may be well in a few days. In a week or two these symptoms may recur, perhaps on the opposite side of the body; the gait may be typically hemiplegic, but more probably it will be one of small quick steps (*Marche à petit pas*) in which each foot is advanced in front of its fellow by only a few inches. There may be retropulsion alternating with this odd little quick-step forward. The coordination of facial movements is impaired, the face may be asymmetrical, or one side of it may be incapable of emotional expression if the thalamus has been affected; a hemianopic quadrant defect in the visual field may appear. Synergy and balance may be impaired, and in right sided hemiplegias there are dysarthrias and difficulty in swallowing. A peculiar and typical dysarthria is the necessity of forcible explosive repetition of key words in a sentence. "I want, want, want a knife, knife, knife." If the lacunar disintegration has been bilateral the picture produced may be that of pseudobulbar palsy with spasmodic involuntary laughing and crying—the emotional expression being usually irrelevant and inappropriate to the producing stimulus.

There is little to distinguish senile epilepsy from the

epilepsy of youth. Both major and minor forms occur, the aura and initial cry are less common, the coma after the fit more prolonged. Senile epilepsy, however, either produces or is accompanied by rapid mental enfeeblement. It is definitely a product of arteriosclerosis, and such brains are characterized by lacunar and senile plaques.

To have to listen to a narrative of the delapidation of the master organ of life is lugubrious and depressing; the picture looks like one of annihilation, a going down to oblivion and the dark shadows—but into that blackness man's spirit throws a mighty beam, for

* "If it be Life that waits we shall live forever unconquered.

If Death, then we shall die at last, strong in our pride and free."

MENOPAUSAL AND POST-MENOPAUSAL CONDITIONS IN WOMEN¹

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The menopause is a very definite epoch in the life of a woman with which there is nothing comparable in the life of a man. Whilst it is determined by strictly physiological processes these may easily pass on to the pathological, and the physiological readjustments which take place may bring to light hitherto unrecognized and unnoticed dysfunctions in the different organs and systems in the body.

For an understanding of these pathological states it is necessary to have as clear an idea as possible as to what the menopause is, how it is brought about, and what are its normal effects on the various tissues, organs and systems of the body.

* Inscribed on Memorial Chapel to the Scottish War Dead, Edinburgh Castle.

¹ Delivered October 4, 1928.

THE NORMAL MENOPAUSE

The menopause is the time at which the female reproductive organs cease to function. This cessation of function is directly due to the exhaustion of the primordial follicles in the ovaries so that ovulation no longer takes place and conception is impossible. At the same time the internal secretion of the ovaries fails and menstruation ceases. There then takes place a slow, atrophic change in all the organs of generation, internal and external.

The withdrawal of the ovarian secretion from the circulation causes a temporary upset in the function of other glands of internal secretion such as the thyroid, suprarenals and pituitary. This upset may be evidenced by tissue changes and general symptoms of various kinds and these may be so marked as to constitute a pathological state. It may, however, be stated at the outset that in the average woman with healthy organs the menopause causes very little general upset and is not accompanied or followed by any pathological lesions of the pelvic organs.

In considering the pathological menopause, and disabilities arising from it, it will be well to take up separately the local pelvic lesions, and then disturbances in other organs and systems.

MENOPAUSAL HEMORRHAGE

The actual cessation of menstruation may take place in a variety of ways. It may occur suddenly and completely without any warning. This is unusual except in those cases where the menopause has been induced artificially by removal of the ovaries at operation or by X-ray or radium treatment.

More often the periods first of all become irregular the patient skipping one from time to time, and losing less and less blood at each. The intervals between the periods gradually lengthen until complete cessation occurs. In other instances the amount of the flow may be increased and the periods be more frequent than normal. These con-

ditions may obtain for several months or even years before menstruation completely stops. In some such cases the flow becomes very excessive so that it amounts to flooding and the patient may be reduced to an extreme degree of anemia.

It is important to recognize these different ways in which the cessation of menstruation may occur in order to distinguish the physiological from the pathological.

As has been stated cessation of the periodic menstrual flow is due to the withdrawal of the internal secretion of the ovary from the circulation. This withdrawal is as a rule a gradual process and whilst it is occurring certain changes of the nature of a senile atrophy are taking place in the uterus, both in its muscular wall and in its mucous membrane. In the uterine wall there is a gradual replacement of muscle fiber by fibrous and elastic tissue and in the mucous membrane the stroma becomes more fibrous, the blood vessels become fibrosed and the glands atrophy. The endometrium becomes more and more like any other mucous membrane in the body. As the stimulus from the ovarian secretion becomes less strong so the response of this fibrosing uterine mucous membrane becomes more and more feeble. There are fewer active proliferative tissue changes in the premenstrual period, less congestion and, therefore, less loss of blood at the period, and more feeble regenerative changes in the post-menstrual period. The endometrium thus becomes more and more a fixed passive tissue and ultimately so fibrosed as to be incapable of any response to the ovarian hormone.

The smooth, well-ordered menopause, with gradual cessation of menstruation is dependent upon the diminution in the amount of ovarian hormone and the fibrotic changes in the uterus occurring simultaneously and in equal degree.

If the ovarian secretion fails abruptly there will be a sudden and complete cessation of menstruation although the uterus has undergone little or no atrophic change.

On the other hand if the fibrotic changes of the uterus are in advance of the degenerative changes in the ovaries the patient will almost certainly suffer from menorrhagia which may amount to flooding. The reason for this is that the ovarian secretion is still powerful enough to call forth the histological changes in the uterine mucous membrane which culminate in the menstrual flow. That flow is excessive and prolonged, firstly, because the uterine muscle, partly replaced by fibrous tissue, is no longer capable of normal contraction and, secondly, because capillaries in the endometrium have become thickened and sclerosed and are no longer capable of closing by collapse of their walls as they normally should. There is thus both an excessive blood loss and prolongation of the period. This I think is the most rational explanation of the excessive menstruation which not infrequently antedates the menopause and also of these cases of profuse hemorrhage occurring in women in the late thirties and early forties.

In these latter there are usually other clinical evidences of premature fibrosis uteri such as lacerated and infected cervix, large, hard, heavy tender uterus, and occasionally inflamed appendages. The cases of severe pre-menopausal and menopausal hemorrhage due to early and excessive uterine fibrosis do not respond to any form of medical treatment. The uterine wall is incapable of any reaction to such drugs as ergot or pituitary extract. Curettage while necessary for diagnosis is not curative so that if the menorrhagia is severe resort must be had to radiotherapy or hysterectomy. In the choice between these forms of treatment some regard must be had to the possible etiology of the condition. Some of the cases show undoubted evidence of chronic infection with lacerated, eroded and thickened cervixes as well as enlargement and sclerosis of the body. In such the patients present a picture of a chronic toxemia in addition to that of anemia and, in my experience, a total hysterectomy gives them the best hope of good health in the future. On the other hand, we may find the cervix healthy and the only disability of the patient that due to blood loss. In such radium or X-ray

treatment is better—always, of course, preceded by a diagnostic curettage.

I believe that a big field of preventive medicine is open to obstetricians and gynecologists in the early recognition and treatment of cervical tears and infections following childbirth as a prophylactic against the development of chronic metritis or fibrosis uteri with its attendant menorrhagia in the later years of sexual life.

There is another histological picture found in some cases of severe menopausal hemorrhage, namely, what we have come to call a cystic glandular hyperplasia of the endometrium. In this condition the endometrium is thickened, the stroma is of normal structure, the blood vessels are large and numerous, but not thickened, and the glands are irregular in size and shape, many of them large and dilated and all with active epithelium. This condition while most commonly seen near the time of the menopause may occur in quite young women. Like fibrosis it is not amenable to drug treatment or curettage and may call for radiotherapy or hysterectomy.

The constant problem that presents itself to us in all these cases of excessive and of irregular bleeding at or near the age of the menopause is that of determining whether the bleeding is really menstrual in origin or whether it may be a symptom of a new growth and especially of a cancer of the cervix or body of the uterus.

It goes without saying that every patient presenting herself to us with these symptoms should have a most careful and complete pelvic and general physical examination. This is sufficient to exclude gross cancer of the vagina and the portio vaginalis of the cervix. It tells us nothing of the upper reaches of the cervical canal or of the endometrium. Information regarding these can be got only by a dilatation of the cervix and curettage of the uterus followed by histological examination of the tissue removed.

Under what circumstances is it our duty to recommend and urge this? In what instances may it safely be dispensed with?

It is necessary to formulate some sort of answer otherwise we should on the one hand miss some early cases of cancer or, on the other, subject needlessly a very large number of women to surgery. In general terms it may be stated that if the bleeding is periodic, lasts only a certain definite number of days and then stops, is preceded and accompanied by the feelings the patient has learned to associate with menstruation, then no matter how excessive it may be it is menstrual in character. Such bleeding is not caused by a fibroid tumor, by a fibrous polyp, by a fibrosis uteri, or by a cystic glandular hyperplasia. In these cases the amount of blood loss and its effect upon the patient will be the determining factor for or against diagnostic curettage and further surgical or radiological treatment.

Again, if a woman has apparently had the menopause established after a period of irregularity and then four, six, or eight months later again has vaginal bleeding a careful pelvic examination must be made. If such examination reveals nothing abnormal in cervix or vagina we are justified in waiting a short time before urging a curettage. If the bleeding stops in a few days and there is no recurrence we can conclude that it is a belated menstruation. On the other hand if it continues for over a week or stops in a few days and then recurs, no matter how slightly, diagnostic curettage ought to be urged.

If uterine bleeding of any character occurs more than a year after the menopause and nothing can be found on ordinary pelvic examination to account for it we fail in our duty to our patient if we do not advise exploration of the uterus. In this connection let me urge that even when an apparent explanation for the bleeding is found, such as a small cervical mucous polypus, it be not concluded that that is the only cause of the bleeding. I have seen in consultation two patients who had such polypi removed by their doctors in their offices, who continued to bleed, and who both turned out to have carcinoma of the en-

dometrium. I make it a rule when a woman past the menopause has vaginal bleeding and a cervical polyp is found that she be given an anesthetic, and the uterus be curetted when the polyp is removed.

If we remember the simple fact that cancer of the uterine endometrium or of the cervix bleeds because it ulcerates and that, therefore, the bleeding is independent of, and unrelated to, menstruation we shall be in less hesitancy as to the type of case in which exploration of the uterus is obligatory. In a case of advanced fibrosis uteri with actively functioning ovaries there is practically continuous bleeding because the blood vessels of the endometrium opened up as the result of one menstrual stimulus have not closed before the next stimulus arrives. In such a case a diagnostic curettage is the only means of distinguishing it from carcinoma or other uterine lesion.

A fibrous polypus projecting from the cervix and ulcerating causes intermittent or continuous bleeding, and such polypi are most often found in women at or after the menopause. The atrophy of the uterus in the post-menopausal period is a factor in extruding such tumors from the uterine wall and out through the cervical canal. It is interesting to note that very often such tumors are found in women who have had several children—the type of patient in whom one least expects to find the ordinary fibroid during active sexual life.

The only other bleeding condition to be mentioned now is senile endometritis, a condition occurring some years after the menopause in a uterus which has undergone extreme atrophy and in which, as a rule, the cervical canal is occluded by plastic adhesions. This occlusion of the cervix is not permanent or complete for it, apparently, allows access to the uterine cavity of organisms of decomposition which acting on the necrosing lining of the uterus produce an extremely fetid discharge. This may escape into the vagina from time to time and in nearly all cases it is blood stained as a result of deep ulceration into the uterine wall. The occurrence of such a fetid blood-stained

discharge in a woman past the menopause, of course, at once conjures up the picture of cancer. It is only on diagnostic curettage that that diagnosis can be excluded. In cases of so-called menopausal or post-menopausal arthritis the possibility of partial occlusion of the cervix and the locking up of small pockets of pus in the canal or in the uterine cavity should be borne in mind. There are numbers of cases on record where the draining of such collections has resulted in a disappearance of the joint condition.

Leaving now the uterine hemorrhages let us turn for a moment to other conditions arising as a result of the atrophic changes following the menopause. Of these, by far the commonest is cystocele. If the proper supporting fascia of the bladder has been grossly injured during childbirth a cystocele will develop very soon after. Such a cystocele tends to become progressively larger up to and after the time of the menopause. In many instances, however, the damage has not been sufficient to result in a definite prolapse of the bladder at the time and this may not become apparent until one or two years after the menopause when it gradually develops as the result of loss of support due to atrophy of the pelvic fascia. In such cases incontinence of urine, an inability to retain urine under such strains as coughing, laughing, or making a sudden movement, is a common symptom. As a rule cystocele and prolapse of the other pelvic organs become aggravated after the menopause. It is, therefore, well to advise patients with these conditions to have them treated operatively as soon as their child bearing period is over and certainly before post-menopausal atrophy has rendered the proper fascial and muscular supports of the organs feeble and difficult to define.

I never operate on a case of prolapse in a woman over fifty without thinking of all the years of disability she has gone through, putting off the evil day of operation in the hope that the change of life would make things better and finding instead that it made them worse.

Normally after the menopause the folds of the vagina become smoothed out, the epithelium becomes thin and the walls contract, especially in the region of the fornices which become shallower and shallower until the roof of the vagina becomes cone-shaped with the small atrophied cervix at its apex. At this stage the uterus has become a shrunken organ and as a rule lies in a position of slight retroversion. At this time a condition known as senile vaginitis may develop. This takes the form of small areas from which the epithelium has become completely desquamated and which exude a watery discharge, often blood stained. These areas have a red color giving to the vaginal walls a red, irregularly mottled appearance. Saprophytic organisms grow on the desquamated epithelium producing a thick, often fetid, discharge, which irritates the lower reaches of the canal and the region of the vestibule and vaginal introitus. The patient suffers from itching and pain and may be rendered extremely miserable. There is a tendency for the walls of the vagina to become adherent especially at the roof and dyspareunia may be a prominent symptom. As the result of atrophy in the vestibule there may be undue exposure of the urethral mucous membrane which becomes inflamed and sensitive. Or, a urethral caruncle may develop.

The early stages of this condition of senile vaginitis may be present before the menopause is established. It is important to recognize them then, as treatment may be effective. The application of iodine or of 15 per cent. nitrate of silver solution to the individual areas together with the administration of ovarian substance may be curative. When the discharge is fetid and blood stained no treatment should be undertaken until a possible carcinoma of cervix or fundus uteri has been ruled out.

An extensive atrophic condition may develop in the vestibule, in the labia minora, and round the vaginal entrance. The epidermis becomes thin and the sub-dermic tissue undergoes extreme fibrosis and contracture. There is a severe pruritis and pain from the contraction of the

parts. To this condition the name kraurosis has been given. It is extremely resistant to treatment although good results have been recorded in a few cases from the use of ovarian extracts. It is a condition to be distinguished from leukoplakia vulvae which affects the skin surfaces outside the region of the vestibule and which is often a precursor of cancer. Kraurosis is not a precancerous condition except in so far as the severe itching may lead to the production of abrasions and fissures by scratching. Such areas in elderly people are never free from danger.

Pruritis vulvae is a generic term applied when any condition produces itching in the vulvar and perineal region. It is commoner at the time of and after the menopause than at any other period of life. It always calls for the most careful investigation as it may be due to such a variety of conditions—pediculi, round worms, glycosuria, irritating cervical and vaginal discharge, leucoplakia, kraurosis and cancer. In some cases all of these can be ruled out and no lesion is detectable except that due to scratching. In such, treatment by X-ray often gives relief. A few words may be said regarding the effect of the menopause on pelvic neoplasms.

UTERINE FIBROMYOMA

It is a well recognized clinical fact that a woman with uterine fibroids tends to have a delayed menopause. Such women often go on menstruating till well over fifty. It is, therefore, a mistake to encourage a woman who is having menorrhagia from a fibroid tumor to wait for the menopause for relief. She may be incapacitated for the best years of her life if she does so. While small, symptomless fibroids usually undergo retrogression and may practically disappear after the menopause, these which give rise to symptoms of any kind ought to be treated by operation or by radiation whenever these symptoms call for it. At and after the menopause various degenerative changes may occur in the tumors and may make their removal advisable. One of the commonest of these is cal-

cification, which may render the tumor so heavy as to cause pressure symptoms necessitating operation. Reference has already been made to the extrusion of a fibrous polypus at or after the time of the menopause.

CANCER OF THE UTERUS

One of the very interesting facts regarding the age incidence of cancer is that cancer of the cervix occurs at an earlier age than cancer of the body of the uterus. The former is common at about the age of the menopause—thirty-eight to fifty. The latter is common in the years which succeed the menopause—fifty to seventy.

OVARIAN TUMORS

Ovarian tumors may be present at any age. Those seen in very young girls and those seen in women after the menopause are more likely to be malignant than those occurring in women during their active sexual life. An ovarian tumor in a woman of fifty or over, especially if associated with ascites, should always be regarded with the greatest suspicion.

Let us now turn for a short time to a consideration of the normal changes and the possible disabilities which may occur in the woman generally, at and after, the menopause. These result from the withdrawal of the ovarian hormone from the circulation. I shall not dwell long on this part of the subject as the speaker who is to follow me will deal with it in a much more informed and authoritative way than I can.

While it is true that the ovary is essential for reproduction and its internal secretion is necessary for the function of menstruation and for the maintenance of the uterus in such a condition that it can embed and nourish a fertilized ovum yet the ovary in its turn is dependent on other organs for its efficiency. The more the actions of the various ductless glands are investigated the more apparent

does it become that there are various and complicated interactions between them and that the failure of one will lead to disordered action in the others. Thus while the menopause is directly due to the failure of the ovary to produce and pass into the circulation its hormone or hormones this failure may be the result of dysfunction of one of the other ductless glands. Thus a thyroid or a pituitary deficiency may lead to amenorrhea and to sterility long before the usual age of the normal menopause. We see this in the case of the thyroid in myxedema and in the case of the pituitary in Fröhlich's dystrophia adiposo-genitalis.

So, conversely, when the ovarian secretion fails there are effects on the other ductless glands and these effects may produce symptoms. In the normal natural menopause the withdrawal of the ovarian secretion is a slow, gradual process and the adjustments take place with little disturbance to the individual. If, however, the ovarian secretion is withdrawn suddenly at the time of the natural menopause or as the result of castration, either by operative removal of the organs or by radiation, marked general disturbance may result. In this connection it is interesting to note that the symptoms of the artificial menopause are always more marked and more prolonged after the removal of comparatively healthy ovaries than after the removal of those more grossly diseased. In the latter case there has been a gradual failure of function and readjustments have been going on before the final ablation.

I heard from a colleague the other day of a patient who had a castration dose of X-ray fifteen years ago to render her sterile and who now at the age of forty-five suffers from menopausal symptoms as intensely as she did a year after treatment.

Most women have an altogether exaggerated and distorted idea of the disabilities and dangers of the menopause. This is due to that unfortunate trait in the character of the average woman which impels her to communi-

cate to her kind all the stories of distress and disaster which may have come to her notice and to let nothing be lost in the telling thereof. It has always seemed to me strange that such tales should be so common regarding natural processes like childbirth and the menopause and that an educational campaign should be necessary to instill a little knowledge regarding the early symptoms and nature of cancer.

In the average healthy woman the menopause is not accompanied by distressing symptoms and it is not likely to precipitate disease in extra-genital organs. She may experience certain vasomotor disturbances such as hot flushes and sudden perspirations, slight attacks of dizziness or of headache. These are the result of imperfect vasomotor control as the result of the gradual withdrawal of the ovarian secretion. Such symptoms are usually more marked with an artificial menopause due to castration than with a normal climacteric. They are best relieved in my experience by the administration of a preparation of Whole Ovarian Gland. I know that it is held by many and they have some scientific evidence for their belief, that the oral administration of all gland preparations except thyroid is valueless as their active substances are not absorbed through stomach or intestine. I have no proof to the contrary, but I have frequently noted clinical improvement in patients with the above mentioned symptoms when ovarian substance has been given by mouth. When both ovaries have been removed by operation the implantation of even a thin slice of one of them into the rectus muscle postpones and may ward off altogether these unpleasant symptoms.

General nervous symptoms, of which the commonest are irritability, inability to concentrate, and mental depression occur in a certain number of women. These symptoms are the same as those which many women experience during and towards the end of each menstrual period. It has been conclusively proved that "in the organism of the healthiest woman there is a monthly period of depres-

sion in her vital processes which finds definite expression in all her activities" including the psychic and nervous (Graves). When the monthly cycle is disappearing at the menopause this period of depression may become more prolonged and may last for weeks or months instead of days. If there is an inherent or inherited instability of the nervous system all the symptoms will be more marked. They are aggravated by dwelling upon them and by the fact that at this time many women are leading an aimless and purposeless life. Their children have grown up and have homes of their own. Their households no longer demand the greater part of their day. They have no mental occupation and fall an easy prey to depression and ennui. As Brettauer lately pointed out, if more women cultivated a hobby which would occupy and interest them after their retirement from the active business of rearing a family and managing a household there would be fewer psychoneurotics.

One might mention a host of other pathological conditions occurring in women at or after the age of the menopause but these would be outside the scope of our subject for they are in no way related to the menopause as such, but are incident to the aging process and will be dealt with or have already been dealt with by other speakers.

For most women fortunately the years which succeed the menopause are the most peaceful, the most mentally productive, and the most satisfactory in their lives.

UROLOGY, ITS CONTACTS WITH GENERAL MEDICINE¹

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In casting about for a subject to present to this audience, it occurred to me that before a group of professional men, many of them engaged in the various specialties, per-

¹ Delivered October 5, 1928.

haps a greater number engrossed in general practice, it might be well, rather than read a communication on a formal topic, to touch here and there on the high spots of the subject as a whole and to emphasize such features as may prove interesting and perhaps informative to the general practitioner.

That the profession owes much to the urologists is easily susceptible of proof. It suffices merely to mention the tremendous lowering of the mortality rate in prostatectomy, the development and refinement of the cystoscope and the establishment on a sound basis of the value of blood chemistry. The latter, it might be added, was routinely employed in urology before its general acceptance in medicine. When we add to this renal function colorimetric tests, the roentgenographic study of the genital tract, uretero-pyelographic, cystographic and seminal-vesiculographic delineation of these structures with mathematic precision, it is safe to state that urology at least from the standpoint of diagnosis, is within 5 per cent. of an exact science. None excels, and it is doubtful if any branch of medicine equals it in scientific accomplishment in the past decade. Twenty-five years ago when I first entered this field of activity the leaders were men of the broadest culture, possessed of an intellectual accomplishment that it would be difficult, if not impossible, to match to-day. To mention a few: the elder Keyes, Tilden Brown, Bolton Bangs, Alexander, Fluhrer, Hadyn, Morton. These gentlemen, notable for many attributes, possessed from my viewpoint, one outstanding quality—marvelous tactile sense. This because of the fact that many of the procedures now done in the open or under precise vision were in those days closed operations where the slightest error in tactile interpretation might have been a matter of serious import. To-day, because of the striking development of cystoscopic and endoscopic instruments, of instrumental operative procedures with telescopic equipment, with but one or at the most two exceptions there is no reason for performing these procedures without adequate visualization.

Aside from its ever increasing scope the distinction between the urology of twenty-five years ago and that of to-day is one of visualization.

To relate here the many causative factors of pyuria, hematuria, nocturia and so forth, would serve to defeat the purpose of this communication, which is, to stress such important features as have a generalized, and at the same time, practical application. Pyuria may take its origin in the kidney parenchyma, the renal pelvis, the bladder, the seminal vesicles, prostate, Cowper's Gland, the Glands of Littre or the Lacunes of Morgagni. Microscopic pyurias are, to the general practitioner, frequently misleading. Here enters the question of the procedure of the collection of specimens. The first requisite is sterile bottles or test tubes. It is a routine procedure in our office to send only sterile catheterized specimens of female patients. The same practice is carried out in males who have microscopic pyuria and who give a remotely antecedent history of urethritis, or, in whom we suspect a low grade prostatitis. Microscopic study of the prostatic-vesicular secretion, together with catheter specimens of the urine, clears the diagnosis of many of these cases. Insurance companies, it seems to me, for the most part overlook this point: many cases are rejected, who after a proper treatment become good risks.

On the question of what constitutes pus in the urine, or where the border line between the normal ends and microscopic pyuria begins, we have no universally accepted rule; some laboratories report any leucocyte observed in the high power field of a centrifuged urine, as a pus cell. This, I consider misleading. Here is what one highly qualified technician said in answer to my question on this matter: "Polymorphonuclear leucocytes are as a *general* rule an *evidence* of inflammation. A few polys are always to be regarded with suspicion and the cause for their presence ascertained. A few mononuclear leucocytes can be considered normal. Clumped leucocytes are always an *evidence* of pus microscopically." Where 7-10 polynuclear leucocytes are present in a 1/12 oil immersion field, it may

then be said that a pyuria is present, even though the remainder of the field is full of blood cells. Clumped leucocytes are, of course, evidence of pus.

Here is another opinion as to what should constitute the requisites in reporting microscopic pyuria. Fifteen c.c. of urine should be centrifuged 5 minutes, the sediment spread out over an area of about 4 square centimeters and the number of pus cells per high power field reported. Leucocytes showing clumping and granular degeneration in the cytoplasm we characterize as pus cells. Leucocytes scattered throughout the field without clumping and showing distinct nuclei in a clear cytoplasm are called leucocytes. Methods of microscopic examination of urine for erythrocytes and leucocytes in urine should be standardized for all laboratories. The occurrence of 5-10 pus cells per high power field in the urine is significant and the cause of this should be determined. A differentiation of pus cells from leucocytes, should be based upon examination of a stained smear of centrifuged urinary sediment. Loose methods of reporting quantitatively the number of pus cells should be discarded and the number of cells in a field seen under the high dry objective definitely counted.

The foregoing, obviously, is a situation calling for correction and definite standardization. Medical men depending upon outside laboratories for this information should be insistent in their demands for precision in reporting such findings. The reaction to litmus of such pyuric urines is of value, inasmuch as bacteria are highly selective as to the media in which they thrive. It seems to me likewise inadequate to have a knowledge merely of the fact that a urine is alkaline or acid. There are times when the degree of alkalinity or of acidity is a matter of considerable moment and inasmuch as these tests are simple colorimetric procedures the quantitative estimation of the alkalinity of a given specimen of urine may prove at least informing.

URINARY INCONTINENCE AND RETENTION

I link these conditions because it has been my observation that medical men frequently misinterpret the one for the

other. In all cases of apparent urinary incontinence and, in fact, in most cases of frequency of micturition in male or female, the residual urine should be estimated. If there be more than should be withdrawn at one time, and that is not much, the bladder may then be outlined by palpation and percussion, to give an approximate estimate of the degree of total retention.

Decompression of retained urine is a subject of the utmost importance and one to which a great deal of study has been devoted by urologists during the past few years. Of course, it cannot be accorded proper consideration in the time here allotted, yet it is not too complicated that it may not be boiled down to simple rules. It is for the general practitioner to determine that the patient has or has not residual urine; it should not be his concern how much, at least, by the method of rapid decompression—leave this determination to palpation and percussion, thus conserving your patient. The disastrous consequences ensuing upon rapid or over-zealous decompression of retained urine, should be, but is not always, a sufficient deterrent even to the expert to keep off. Where, however, circumstances or the exigencies of any given case call for gradual decompression at the hands of the general practitioner, the following procedure may successfully carry him over a trying spot. While for the most part many methods of gradual decompression have been suggested, because of their difficulty and complexity, very few of them have been accorded general use. To Dr. Rose, of Cleveland, however, I am indebted for the simplest and at least as effective a method as any hitherto employed at my hands.

Returning from a meeting of the American Medical Association at Minneapolis last June and chatting over the subject with this gentleman, who in my opinion has devoted much study and discriminating thought to the complex physical and neurological problems involved in this condition, I asked him what in his opinion was the nearest to an ideal method of decompression. His answer was "an indwelling No. 6 ureteral catheter and at the same time

giving the patient enough fluid intake so that the output was maintained just a little ahead of the intake." Since this time we have employed, with a slight difference in procedure, this general principle, with the utmost satisfaction. We have found, however, that a No. 7 or No. 8 French, soft rubber, urethral catheter, in other words, a child's size catheter, has worked out in a gratifying manner. In a few cases, where even a No. 12 or No. 14 French, soft rubber catheter was not tolerated by the patient, the substitution of the much smaller sized catheter just mentioned was borne with the greatest comfort to the patient and satisfaction to myself. It is safe to predict that with the strictest surgical asepsis, general practitioners, where the necessity arises for this procedure, with the same directions as to intake of fluid, may employ this measure with a comforting sense of security. Finally, make this a rule—in all cases of frequency, or urinary disability, male or female, unless there be a specific contra-indication, ascertain whether residual urine exists or not, and if you can restrain yourself, do not withdraw more than is sufficient to indicate that there is or is not residual, and if there be residual, complete your education on the subject by palpation and percussion of the bladder itself. *In all supposed prostatitis, incontinents, or retention cases*, suspect tabes, test their knee jerks, pupillary reactions, equilibrium, routinely Wassermann all patients, and inasmuch as incipient tabetics are frequently negative to Wassermann they should, when under suspicion, have spinal fluid examination. This is not anybody's job, simple as is the procedure: select the individual whom you would have do it on yourself—if you'd *have* it done on yourself. Incidentally it is better to drop the term "Wassermann" as the latter carries considerable significance to the lay public. We like the term "Kahn Test." (Not original with us).

PROSTATIC SURGERY

The time for prostatic surgery is when an individual in the prostatic age manifests an appreciable degree of dif-

ficulty in the act of micturition, together with night frequency, with residual of 2-3 ounces; and when these clinical manifestations fail to yield promptly to the ordinary conservative measures. My colleagues will tell you that I am a confirmed conservative, but, if a continuous experience since 1901 has taught me anything, the lesson I have learned is, do not putter or procrastinate with a well established prostate. If you do, it will continue to grow and spread out in business and it will be bad business for your patient. To massage a true hypertrophied prostate is some degrees worse than taking money under false pretences. Surgery of the prostate, however, does not of necessity imply prostatectomy; it may mean the simple intra-urethral removal of a segment on the floor of the prostatic ring. I will later visualize this procedure. (Considerable success has attended the use of burning a channel through this bar by means of a diathermic or endothermic electrode, but in my hands the visualized punch procedure to be later described has given me, at least, the greater satisfaction.) Let me emphasize, lest it be forgotten, that while there are a number of advocates extending the field of usefulness of this step to adenomatous prostatic intrusion, my experience to date has not justified its extension or its application beyond that of the fibrous prostatic bar or so-called collar type of prostate. It is quite possible, however, that because of the notable recession in size of an enlarged prostate following a punch operation, this step may eventually when employed sufficiently early, prove a veritable boon to prostatitics.

Prostatic hyperplasia is a highly disorderly process, one lobe may enlarge to the exclusion of the other, or they may enlarge simultaneously if in different degree. Remember, too, that digital examination of a prostate tells but part of the story. One should bear in mind that this organ enlarges in one or all of three directions—intravesically, intra-urethrally, and intra-rectally. With this in mind one may not conclude because of the fact that there is no manifest intra-rectal encroachment that the prostate is not an obstructing one. Digital examination in carcinoma of

the prostate, it should be noted, is most informing, as its earliest manifestations are there.

NOCTURIA

For the proper recognition of the underlying factors in nocturia or night frequency many things are to be considered. At the beginning the observer must note whether it is a polyuria, meaning a large increase in the volume of urine necessitating frequency of micturition, or, an irritative nocturia; by that I mean a localized irritative condition. Whether it be a general constitutional or a local urological one. To this end twenty-four hour total volume urine is necessary, the amount voided at each act of micturition, the specific gravity, the comparative diurnal frequency, the presence or absence of residual urine, the most painstaking history, a complete physical, a quantitative diurnal as opposed to the quantitative nocturnal nitrogen urine output. If this data is not productive of diagnosis a complete instrumental urological survey with colorimetric tests, biochemical studies, etc., is the rule.

It has been previously claimed here that urology is within 5 per cent.—let us say to be liberal, within 10 per cent.—of exact diagnosis. Well of this percentage of failures in early diagnosis 80 per cent. are women. If an urologist cultivates an exaggerated ego, a half dozen consecutive cases of women in middle or later life suffering from micturitional frequency, urgency, dysuria, nocturia and so forth, will quickly deflate it. I know they have helped me retain my innate modesty. Years ago from sad experience I learned the importance of estimating residual urine in women, something urologists are apt to overlook. It has been my experience in many of these cases after most complete examinations, to find myself at a loss to account for the severity or the persistence of symptoms in women of this type. Whether obscure bladder ulcers, equally obscure abnormal narrowings or angulations of the ureters as I suspect, is the underlying cause in a considerable number of cases, I cannot at this time with sufficient assurance determine, but that they are difficult to a degree, I will

freely concede. Inasmuch as many of these women are at or about the period of menopause it is highly probable that this interposes a not inconsiderable factor. Such cases impress the urologist with his lack of foresight in neglecting the study of psychiatry. Occasionally a mild and easily overlooked urethral lesion may be the only demonstrable cause. Not infrequently a very small caruncle, when removed, results in the complete disappearance of these unpleasant manifestations. A case of urethral diverticulum was discovered only after five or six instrumental examinations. This woman, a young married subject, was incontinent only on walking. The mechanism was that in the act of micturition the diverticulum filled and this sac emptied itself external to the sphincter under activity. It is quite evident, therefore, that we have much to learn about this interesting, if perplexing, phase of urology.

HEMATURIA

Hematuria refers to bloody micturition. Blood in varying amounts, microscopic and macroscopic, in a voided specimen. While in pyuria catheterized specimens are the rule, in hematuria voided specimens are customary practice. The presence of blood is determined by its gross physical aspects, microscopic study, and chemical tests, such as benzidine. The intensity of the bleeding is determined by the density of coloration and character of clots. In massive hemorrhage one should never forget palpation and percussion note of bladder. This latter step sometimes tells the whole story. In the non-retention type the quantity of blood lost in a given specimen of urine may be estimated by the following test, worked out at my suggestion in our laboratories at the Post Graduate by Dr. John A. Kilian. To the best of our knowledge this procedure has not hitherto been employed clinically. It is as follows: Determine colorimetrically the amount of Iron in the urine—as the percentage of Iron in Hemoglobin is 39 per cent. and the Hemoglobin about 15 per cent. of whole blood, the calculation is a simple one. The entire procedure requires about 15 minutes.

Constitutional tests, hemoglobin, red cell count, blood clot time, general aspect of the patient are all to be considered. Careful history, physical examination, blood chemistry, blood pressure and so forth, will help the practitioner or specialist to determine whether one is dealing with a so-called medical or surgical hematuria. From a symptomatic standpoint and as an aid to interpretation of the etiology, the various types of hematuria should be noted. Remember it is not enough to say that a patient has hematuria. One should, because of its significance, know that it is an initial, a terminal or a total hematuria. This knowledge frequently leads one to the diagnosis. Pain and the effect of movement should also be carefully noted for the same reason.

Management: The first reaction of the medical observer to the presence of hematuria in a patient is or should be, that it is in effect nature's call for help and should the doctor neglect its warning he is patently derelict; secondly, inasmuch as most hematurias are intermittent it is dangerous practice to assume that the administration of the customary medication has in any manner been instrumental in effecting a cessation of bleeding. The records of any urologists will show that with few exceptions hematurias are referred to them with histories of blood in the urine any where from six months to several years and because of this neglect, largely chargeable to the general practitioner, many valuable lives are lost. Then too, many medical men and women erroneously believe that it is unwise to submit their patients to cystoscopic study during the period of hematuria. This misconception may result in first, a lost opportunity on the part of the urologist to visualize at once the source of the blood, a knowledge of which is of much value in directing his later studies of the case; or, secondly, when the urine clears the patient as a rule experiences an increased sense of well being, with diminished apprehension and an accentuation of the natural repugnance to instrumental study. The significance of this to the physician and his charge is too self evident for comment.

Under the heading of bio-chemistry I will quote Dr. John

A. Kilian, Professor of Bio-Chemistry of the New York Post Graduate Medical School. He states: "The majority of clinicians know that renal impairment leads to a retention of nitrogenous waste product, urea, uric acid and creatinin in the blood. It should be emphasized that for the mild or moderate impairment of renal function in an ambulatory case, more valuable information can be obtained from the renal test meal so-called, as differentiated from ordinary urine or colorimetric examination. This consists of a comparison of the volume of urine, the total nitrogen and chlorides excreted during a 12-hour night period from 7 P. M. to 7 A. M., with the volume of urine, total nitrogen and chlorides excreted during the 12-hour day period, 7 A. M. to 7 P. M., when the patient has been indulging in his customary diet and usual routine of duty. With normal renal function the amount of nitrogen and chloride of the day period is twice that of the night period. However, with impaired renal function the nitrogen and chloride excretion of the night may equal or even exceed that of the day period. In this increased excretion of nitrogen during the night the body gets rid of the waste accumulated during the day, so that there results no nitrogen retention in the blood. *Considered purely* from the standpoint of the common method employed in the estimation of renal function by the use of phenolsulphonephthalein, much confusion has resulted and many inaccurately diagnoses given. These results have not always been in conformity with the true clinical condition. One reason for this is demonstrated by the fact that some of the phenolsulphonephthalein is metabolized in the body. Crowell, an urologist, by the way, has recently modified this test by collecting urine specimens every 30 minutes and of these specimens determining the total output of dye. This also emphasizes that what we really should be interested in is *not the total output in a given number of hours*, but rather the period of maximal output in the first 30 minutes, as here with normal renal function one should obtain the maximum. A delay of maximum excretion to the third or fourth half hour indicates impairment of renal

function. Experience with this test has demonstrated to us its practical value, particularly in those cases of mild renal impairment showing no chemical changes in the blood. It is an accepted fact that with progressive impairment of renal function there is observed a definite sequence of retention of the nitrogenous waste product, *first uric acid, then urea and finally creatinin*. An increase in blood uric acid is frequently interpreted as an indication of the initial stages of renal impairment. Great care should be exercised in this interpretation because there are other factors entering into this, which time here does not permit to elaborate. Liver functional studies are growing increasingly important in the accurate determination of renal functional diseases. In all cases with renal impairment showing keto-genesis, or vomiting, the alkaline reserve of the blood plasma should be repeatedly determined. The most practical and dependable means of estimating the alkaline reserve of the blood is by determining the *carbon dioxide combining power of the blood plasma*." Then, too, especially in post-operative urological conditions the haphazard administration for any considerable period of time of alkaline or acidulated fluids without regular check-up of the CO_2 combining value of the blood of these patients is not devoid of danger. I have seen patients thrown into conditions of threatened alkalosis or acidosis by the failure to observe this rule. The estimation of CO_2 combining value of the blood in urological cases, especially the graver ones, is to my mind the real outstanding accomplishment in the field of biological chemistry in the last few years. It is something that has not yet come into general use even at the hands of the recognized urological centers of this country. In this connection we have recently added the duodenal tube to our urological armamentarium. By its employment we have been able in a few desperate cases failing to respond to all other measures, to convert these patients into veritable chemical laboratories and have thereby saved a number of lives impossible of salvage by any other method. It has proven in our hands the most effective means of administration of acid, alkalis or other

therapeutic agents for the modification of the composition of blood and in conjunction with grand lavage through this tube we have diminished the nitrogenous blood content in a spectacular manner. It has also been utilized for biliary drainage, which has assisted us in carrying off nitrogenous elements and improving thereby the liver function.

The tendency to acidosis in nephritis can be gauged satisfactorily only by following changes in the inorganic phosphorus of the blood serum. With a rising inorganic phosphorus a fall in blood serum calcium is observed. To avoid a fall in the blood calcium, calcium therapy should be instituted. The efficiency of the calcium therapy can be determined only by a knowledge of the blood serum calcium. Finally your attention is called to the danger from nephritic acidosis by the fall in blood serum calcium to a level below 7 mg. per 100 c.c. of blood. Biological chemistry has given us an insurance policy on our patients, especially in prostatic surgery. It tells us when to lay hands on and when to keep off. It has proven of incalculable value in lowering the previously high mortality rate in this field of surgery, and it is difficult at this time to realize how urological surgery was ever successfully practiced without it.

Acknowledgment is here freely given to roentgenology for its invaluable aid in urological diagnosis. The development of this field of diagnosis has reached such a stage of perfection that no urologist would presume to practice his specialty without a fairly comprehensive knowledge of the subject or at least the collaboration of a qualified roentgenologist. It is my conviction that no examination of a surgical urological condition is complete without roentgenological study.

The brilliant outcome already achieved has by no means been accomplished by roentgenologists unaided. This result has been due largely to the development of the various opaque media at the hands of urologists. The development, however, of uretero-pyeloscopy has not been without untoward incident. In the early days of this work such

media as protargol, collargol, the bismuth preparations were routinely employed and it was soon found that in a considerable number of cases temporary or permanent damage to the extent of complete destruction of the kidneys had resulted. Pain and at times violent reactions were pretty generally the rule following this procedure. Fortunately, however, since the introduction of the use of isotonic solutions of sodium iodide $12\frac{1}{2}$ per cent. or even higher, no such outcome is observed to-day. The reason for this, doubtless, is because of the fact that anything used in the renal pelvis should also be a suitable medium for intravenous injection, such as is isotonic solution of sodium iodide. To-day in properly selected cases we anticipate little or no reaction, certainly no reaction of consequence. When gravity is employed for the introduction of this medium, when these solutions are carried in sterile ampoule containers, and not sterilized repeatedly, it is in our opinion a wholly innocuous procedure. Through the employment of this medium by means of the cystoscope we are able to delineate with the utmost precision the renal pelvis, the ureters, the bladder and the seminal vesicles. To-day we will endeavor to show you an improved technique for delineating the latter organs that has not been, so far as we know, heretofore demonstrated. By this method, the seminal vesicles, a hitherto obscure organ is brought out into the searching spot light of orderly scientific scrutiny, by it not only the physical conformation, but also the unmixed bacteriology of the vesicles, as well as the viability of the spermatazoa in its natural habitat, may be determined; and finally in the presence of sluggishly motile or dead spermatazoa it may be possible by direct treatment to remove conditions inimical to their viability.

My auditors may easily deduce from the preceding remarks that an urological survey is by no means a simple procedure. While the cystoscope is undoubtedly the most important of our diagnostic methods, it is but one of a number of procedures and in itself is never completed in one study. But, where a prompt diagnosis may readily be arrived at in a frank case, the border line case, however, fre-

quently involves a serious study over a period of some days.

To my auditors, most of whom have hospital affiliations, I would stress the importance, if you are not already thus equipped, of establishing separate urological divisions in your institutions—that you subordinate, perhaps, some of your preconceived ideas of custom and precedent and realize the irresistible trend of the times and help your separate departments in the cultivation and development of these highly exacting specialties, such as is urology.

To the educator who still considers urology as one of the minor specialties, I would suggest that he is thinking in terms of the very brilliant, but equally dead past.

ARTHRITIS AND OLD AGE¹

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Old age usually brings with it various uncomfortable ailments, and one of the commonest of these is some form of chronic arthritis. With the advancing years a certain amount of bony and fibrotic change appears to be almost a physiological process—certainly it is a process from which no elderly person escapes. Watch any man of 65 or 70 swing a golf club; the shortening of the arc of the swing is sufficient evidence that the joints of the shoulder and wrist, to say nothing of the lumbar spine, are no longer capable of that wide excursion of movement which characterizes youth. At three score years and ten, radiographs of the joints show more or less new growth of bone around the articular margins, which in itself puts a check on extreme flexion or extension. In addition to this, there is thickening and contraction of the joint capsule and surrounding ligaments. It is safe to say, therefore, that in old age the joints, like other parts of the human machine, show the effects of the wear and tear of living. The joints which have been subjected to the most use are the ones

¹ Delivered October 5, 1928.

which show the greater damage. Furthermore, like other degenerative changes, the arthritis of senility is more conspicuous in some individuals than in others. When these senescent changes become so marked as to cause symptoms, the condition is spoken of as "degenerative arthritis" or "osteoarthritis."

Nearly all careful students of arthritis agree that chronic arthritis manifests itself in two forms which can readily be distinguished pathologically and clinically, and which appear to be of entirely different etiology. The first type is variously referred to as exudative, atrophic, infectious or proliferative arthritis; the second type, as degenerative, hypertrophic or senescent arthritis (osteoarthritis).

Of these two groups the second or degenerative type is by far the commoner in elderly people. Indeed, it is essentially the arthritis of old age and is almost never seen in patients under forty-five. Before proceeding, however, to a discussion of the various forms of degenerative arthritis, it is necessary to refer briefly to infectious arthritis and its relation to old age.

Infectious arthritis usually makes its appearance in early adult life, but it may occur at any age. I have recently seen a case of infectious arthritis which began to develop in a woman in her 71st year. Pathologically, infectious arthritis is inflammatory arthritis. The joint is swollen, and when opened the articular surface is partially or completely covered with granulation tissue which binds the opposing articular surfaces together. This new growth of inflammatory tissue may cause only a shrinkage in the size of the articular cavity, but in advanced cases it completely obliterates it. The capsule and peri-articular tissues are also thickened, due to the infiltration of serum and cells. As time advances, fibrous changes occur which lead to ankylosis and deformity.

In America most of us have accepted the teaching of Billings and his school, that infectious arthritis results

from some primary focus of infection, though European students of arthritis think that focal infection has been tremendously overstressed in America. I believe that anyone who will study infectious arthritis in its early stages, that is, at the stage where it presents itself in the outpatient clinic, will be forced to accept the theory of focal infection. In its earlier stages, infectious arthritis is nearly always associated with a focal infection or at least with a history of focal infection. The removal of such foci in the course of the disease usually leads to recovery from the arthritic symptoms. The point that many have failed to grasp is the importance of attacking the disease and the primary focus before it becomes well established in the joints. I will hazard the statement that if the original focus of infection is removed during the first six months of the disease, the patient will recover in a high percentage of cases.

Our studies at the Cornell Clinic have indicated very clearly that focal infection as it occurs in chronic arthritis shows a definite relation to age. In an analysis of 200 cases of chronic infectious arthritis, the average age of onset in patients with infected tonsils was 30 years, whereas in those with dental infection the average age of onset was 42 years. These figures corroborate the clinical observation that infectious arthritis in young people is associated with diseased tonsils, while in old people the focus is more apt to be located about the teeth.

The streptococcus has long been suspected of being the exciting agent of chronic infectious arthritis, largely because it was found with such regularity in infected tonsils and teeth. However, the streptococci were equally abundant in normal tonsils, and furthermore, various types of streptococci, including the viridans, the hemolyticus and the indifferent type, were all equally well represented so that it was difficult to say which type was the infecting agent and which were merely harmless parasites. Finally, efforts to cultivate a streptococcus from the infected joints themselves have been almost universally negative.

During the past two years, we have been making a bacteriological study of patients suffering from chronic deforming arthritis, giving special attention to cultures from the blood and joints.

By means of a special blood culture technic, the most important feature of which was long incubation, we have been able to cultivate an atypical form of streptococcus directly from the blood stream in a surprisingly large number of patients with chronic infectious arthritis of the variety usually referred to as rheumatoid arthritis or arthritis deformans. Patients who show streptococci in the blood have in a large percentage of cases presented swollen fusiform fingers with swelling of one or more of the other large joints in the body. In advanced cases the swelling was associated with more or less deformity and ankylosis. In 56 cases of chronic infectious arthritis with swelling, 38, or 68 per cent., showed at some time or another a streptococcus in the circulating blood. These streptococci present similar cultural characteristics, and Dr. Edith Nicholls who is collaborating with me in this work, has found that a high percentage of them cross-agglutinate. In 43 control cases, blood cultures without exception yielded negative results. Cultures from affected joints were made in six cases. In two of these, the material cultured was curetted from the head of the femur; in the remaining four, it consisted of excised synovial membrane. It is interesting to note that the cultures from the four synovial membranes were sterile, while in the two cases that had cultures taken from the bone itself, a streptococcus was isolated and in both instances the streptococcus recovered corresponded culturally and biologically with the streptococcus which had been previously cultured from the patient's blood stream. Enlarged lymph nodes were also cultured from two patients suffering with chronic deforming arthritis, but in neither case was a streptococcus found. These streptococci, when injected into rabbits, frequently produced a non-suppurative arthritis, and furthermore, in those rabbits that developed arthritis, a streptococcus could be recovered from the

blood stream. This work has not yet been completed, but evidence so far obtained tends strongly to confirm the theory that chronic deforming arthritis is an infectious disease, usually caused by a particular strain of streptococcus. Of course, almost any of the streptococci can produce an inflammatory condition in the joints, but typical arthritis deformans appears to be caused, certainly in a great majority of cases, by a specific type of streptococcus intermediate between the viridans and the hemolyticus.

Clinically chronic infectious arthritis manifests itself as a migratory polyarthritis which is characterized by swelling, pain and stiffness of the joints affected. The swollen fusiform finger joint presents a typical lesion that sooner or later makes its appearance in nearly every case. These patients are almost always afebrile. The most striking symptoms are loss of weight and strength and secondary anemia. In young people the constitutional symptoms are more marked than in the aged. On the other hand, old people appear to have more difficulty in throwing off the infection.

Degenerative arthritis, as stated above, occurs much more frequently in middle-aged and elderly people than does infectious arthritis. Indeed, degenerative arthritis might be called essentially the arthritis of old age, just as infectious arthritis is essentially the arthritis of young adults.

In discussing the morbid anatomy of degenerative arthritis, it seems fair to draw an analogy between this condition and arteriosclerosis. Both appear to be degenerative processes which are the result of wear and tear on highly specialized tissues. In arteriosclerosis, atheroma, fibrosis and calcification replace the delicate endothelium and muscular coats of the blood vessel. In degenerative arthritis the velvety cartilage wears away and is replaced by dense new bone. The synovial membrane becomes thickened and fibrous. Changes in the synovial membrane appear to be secondary and due to trauma from the bony deformities.

The etiology of degenerative arthritis, like that of arteriosclerosis, is not known. Certainly it is not a true inflammation, as there is never at any stage a formation of granulation tissue. Perhaps the most important predisposing factor in the etiology is old age itself. As the years advance, the wearing quality of the joint is diminished, depending perhaps upon insufficient local circulation. Just as the teeth wear down in elderly people, so the joints, particularly the weight-bearing joints, are prone to wear out as the years advance.

Next to age, the most important factor is trauma. Some form of trauma can be demonstrated in nearly every instance and is usually of a chronic nature. Overweight undoubtedly plays an important part in the etiology of degenerative arthritis. In obese patients the weight-bearing joints are the ones that suffer first, and we naturally infer from this that it is chiefly the strain and trauma to the joint resulting from the overweight that affects the joints unfavorably. Faulty posture predisposes to arthritis by bringing about unequal pressure on the joint surface. Incorrect sitting or standing puts constant strain on the lower spine, just as an improper gait places a tension on the joints of the leg, particularly on the knees, ankles and feet. Obese patients nearly all have a bad posture.

Occupation has an important bearing on the etiology of degenerative arthritis. Laborers and mechanics are most often affected. Any joint which is subject to constant usage is apt to show symptoms in elderly patients. Physical defects, such as curvature of the spine, subluxation of the sacro-iliac joint, flat feet and old fractures involving the articular surface of some joint, all predispose to degenerative changes in the joints affected.

Degenerative arthritis occurs in several clinical forms. The simplest and perhaps the commonest type is the so-called Heberden's node. The female appears to be more susceptible to this type than the male. Heberden's nodes begin to manifest themselves in middle age as bony outgrowths around the bases of the phalanges.

Charcot classified Heberden's node as a form of osteoarthritis, but Stockman, who has investigated them thoroughly, states that in all cases studied the joint remained intact. The cartilage was normal in appearance and there was no absorption or fibrous metaplasia of the subchondral bony trabeculae.

The cause of Heberden's nodes is not known. There is every reason to believe, however, that trauma plays an important part in their production. They are closely related to age, rarely making their appearance before the 40th or 50th year. There is no reason for supposing that they are infectious in origin.

Heberden's nodes develop slowly and cause little inconvenience, rarely interfering with the normal movements of the joint, unless they reach a large size. They may be entirely free from tenderness and pain. Usually, however, in the early stages, they are tender on pressure and cause some limitation of movement. As time goes on, they become very hard and painless. Heberden's nodes must be distinguished from the tophi of chronic gout, with which they might easily be confused. Heberden's nodes are directly connected with the bone, while the tophi of gout can be moved slightly over the surface of the joint.

Morbus corac senilis is another form of osteoarthritis which comes on in middle or advanced age, attacking the hip most frequently, but sometimes involving the shoulder or knee. This form of arthritis usually occurs among laboring people and in contradistinction to other forms of arthritis, is seen more frequently in elderly men than in elderly women. The pathological changes are similar to those seen in other forms of degenerative arthritis, but are apt to be more extensive. The new formation of bone, both around the rim of the acetabulum and about the head of the femur is often marked. This form of osteoarthritis is perhaps more directly related to trauma than the other types. In most cases the disease affects one hip. Occasionally, however, both hips are implicated and in rare instances one hip and one shoulder or knee are affected in

the same patient. Osteoarthritis of the hip is very prone to develop in a middle-aged man after any injury, particularly a fall which strains the hip joint or fractures the head of the femur. There is no evidence to support the idea that typical morbus coxae senilis is infectious. Infectious arthritis may of course attack the hip joint, but when it does, the pathological and clinical features, as well as the X-ray findings, are quite different from the lesions seen in osteoarthritis.

The patient with morbus coxae senilis complains of pain in the distribution of the sciatic, obturator or anterior crural nerve. In the later stages the pain is often definitely related to the hip joint and also to the knee joint on the same side. The pain is at first slight and of a dull character, but increased by movement of the limb. The patient walks with a limp, with his weight on the unaffected side. The foot on the affected side is everted and there is a compensatory tilting of the pelvis and scoliosis of the spine.

There may be some atrophy of the muscles of the thigh, but wasting is never marked because the joint never becomes completely ankylosed. On movement of the joint, crepitation is readily made out. Movement of the joint is limited in all four directions.

Morbus coxae senilis will rarely be mistaken for tuberculosis of the hip, because of the difference in age incidence of the two diseases. It is quite possible, however, to confuse it with infectious arthritis, particularly when the latter condition attacks only the one joint. This, of course, is quite unusual, so rare in fact that on approaching a case of monarticular arthritis in an elderly patient the presumption should be that one is dealing with degenerative arthritis, until it is proved otherwise. We must never forget, however, that infectious arthritis may occur at any age and that while usually polyarticular, it may affect only one joint. I recall a case that confused us somewhat at the clinic. The patient was a middle-aged man with a long-standing arthritis of the hip joint. The diagnosis of morbus coxae senilis was made by the examining physi-

cian. On careful questioning, however, it appeared that he had had a mild polyarthritis several years previous. The symptoms had disappeared from the other joints and persisted in the hip joint. The infectious nature of his trouble was proved by the finding of a streptococcus in curettings from the joint at operation and a similar type of streptococcus was isolated from his blood stream.

ARTHRITIS OF THE MENOPAUSE

Arthritis of the menopause is a chronic polyarthritis of middle-aged women, usually of an obese type, occurring at or just after the menopause, and characterized by degenerative changes in the cartilage and bone of the articulating surfaces. Clinically the symptoms are persistent stiffness and pain in the joints, the knees and fingers being most frequently affected. As a rule there is little or no swelling of the periarticular tissues.

Arthritis of the menopause is the commonest form of degenerative arthritis. It has been one of the most frequent types of chronic arthritis encountered in the Cornell Clinic. Of all the female patients with arthritis admitted to the clinic, one third fell into the group of menopausal arthritis.

Arthritis of the menopause occurs chiefly in middle-aged or elderly women, but it is also encountered in younger women who for some reason have undergone an artificial menopause.

Like other forms of degenerative arthritis, the exact etiology of this particular type is not known. In the Cornell Clinic series, however, reported by Cecil and Archer, 85 per cent. of the cases occurred either immediately after the menopause or within two years thereafter. Only 14 per cent. developed before menopause, and in these cases the symptoms of arthritis preceded the change of life by only a short interval.

Next to its association with the menopause, obesity is the most frequently associated condition. The average

weight in our series of 50 patients was 182½ pounds. In a few patients the weight showed little or no increase, so it may be assumed that while obesity plays an important part, it cannot be looked on as an adequate explanation of the whole picture.

Trauma is undoubtedly an important factor. The condition is much commoner among working women than among the well-to-do. Most of our clinic patients were housewives, accustomed to doing their own work, even to the extent of washing their own dishes and clothing.

In our investigations of menopausal arthritis, focal infection appeared to play a very minor part. Infected tonsils were rarely encountered, and many of the patients had been without teeth for years. Leukorrhea was frequently present, but appeared to bear no relation to the disease.

The morbid anatomy of menopausal arthritis has received practically no study. Judging from the X-ray, the findings are similar to those in other forms of degenerative arthritis. Radiographs of the knee joints, for example, show distinct lipping of the head of the tibia and to a less extent of the condyles of the femur. The spongy bone shows some rarefaction, but the hypertrophied portions are denser than normal. English investigators state that the synovial membrane is thickened and villous.

Clinically, menopausal arthritis presents quite a characteristic feature. The onset is insidious, the first symptom as a rule being a slight stiffness in the knees, particularly when ascending or descending stairs or when arising from a chair. The pain and stiffness gradually become more and more marked and the patient experiences discomfort in walking or bending the knees.

One of the most conspicuous characteristics of this disease is its persistent localization in the knee joints, differing in this respect from chronic infectious arthritis, which is more apt to shift from joint to joint. In 84 per cent. of our cases, the disease made its first appearance in the

knees. Occasionally, however, the stiffness is first noted in the fingers or back, and the knees are involved later on. In 74 per cent. of our cases, the patient suffered from more or less stiffness in the fingers, due to the presence of Heberden's nodes on the distal phalangeal joints. In a small percentage of cases there was pain in the feet or in the lumbar spine.

On physical examination the patient usually presents the appearance of robust good health in contrast to the victim of infectious arthritis, who is usually pale and thin. As stated above, obesity is present in a large percentage of cases. The posture is bad and flat feet are a common complication.

The large joints show comparatively little on physical examination. This is partly due to the obesity of the patient. In thin patients the knees appear more prominent than normal, owing to hypertrophy of the heads of the bones. On flexion a certain amount of crepitation is evident, but actual limitation of movement is unusual. Heberden's nodes are noted in a high percentage of patients. In cases of long standing the physical signs are more marked. The synovial membrane of the knee joint becomes more thickened, grating is more marked and tender points can be brought out on palpation. The synovial fluid may be increased in amount. Heberden's nodes become larger and take on a bony structure, finally causing some deformity of the terminal phalanges.

Menopausal arthritis, like other forms of degenerative arthritis, runs a sluggish chronic course. The progress of the disease is much less rapid than that of chronic infectious arthritis. Sometimes the morbid changes seem to stop short, but usually there is a very gradual increase in the symptoms, due to the increasing irregularity of the articular surfaces. The course of menopausal arthritis is unfavorably influenced by trauma and by hard usage. On the other hand, if the cause of the disease can be removed before great changes have taken place, the symptoms may

in large part disappear, and the joint return to almost normal function.

One other form of degenerative arthritis should perhaps be mentioned, though it overlaps with the others. In very old people there is a *senile* type of degenerative arthritis which is polyarticular and appears to be a more or less physiological process. In 17 cases studied at the Cornell Clinic, the average age was almost 68 years. It may occur in almost any joint of the body, but it is particularly common in the spine, fingers and large joints of the upper and lower extremities. The lesions, as in other types of degenerative arthritis, consist largely of a new growth of bone and cartilage around the articular surfaces, but as in other forms of degenerative arthritis, ankylosis does not occur.

Clinically the patient is conscious of stiffness and more or less discomfort in the joints, particularly on arising and on damp days. With use, however, a certain amount of the stiffness disappears.

Before discussing the treatment of arthritis something should be said about spondylitis. Spondylitis, like other forms of polyarthritis, occurs in two forms, infectious and degenerative. Infectious spondylitis is seen in young people with foci, usually in the tonsils or teeth. Degenerative spondylitis is a part of old age. In the infectious type ankylosis, terminating in a poker-spine, is a frequent end result. In the degenerative form, the intervertebral joints become locked because of the new growth of bone, but do not actually ankylose.

TREATMENT OF ARTHRITIS

The rational treatment of chronic arthritis in old people will depend in great measure on the type of arthritis from which the patient is suffering. If the patient has chronic infectious arthritis with migratory swelling and deformity, an immediate search should be made for a focus of infection, and unless age is a contra-indication, the focus

should be removed. Old age is no longer a contra-indication to tonsillectomy, provided the heart, lungs and kidneys are in good condition. In our experience, however, it is the teeth more than the tonsils that need attention in patients past fifty. If there are several infected teeth, it is better to remove only one or two at a sitting.

Time does not permit us to go into the details of physiotherapy, vaccine therapy and climatology. Once the foci have been removed, I believe that both physiotherapy and vaccines have their place in the treatment of chronic infectious arthritis. The vaccine should be prepared, if possible, from streptococci isolated from the focus of infection. During the past year we have been limiting our vaccine work to streptococci obtained directly from the blood or the joints. In this way we are fairly sure that we are working with the right organism.

In degenerative arthritis the therapeutic problem which presents itself is quite different. Focal infection plays a secondary part. The real problem here is to relieve the affected joints of strain and trauma. This means reduction in weight, correction of deformities and bad posture, possible change of occupation and rest of the affected part. Relief from strain may be obtained by an elastic bandage or in severe cases by some kind of splint. Whereas in infectious arthritis, exercise is found helpful, particularly in a retrogressing infection, in degenerative arthritis rest is absolutely essential. These patients must be cured of the idea so prevalent among arthritic cases that exercise is good for their condition.

Degenerative arthritis as well as infectious arthritis yields to heat, massage and other forms of physiotherapy. Perhaps it would be more accurate to say that the symptoms are relieved by such treatment. The masseur cannot remove Heberden's nodes or spurs around the knee joint by the application of heat and massage, but it must be admitted by even the most skeptical, that heat in its various forms, such as the electric pad, radiant heat, diathermy, etc., gives a great deal of comfort to these patients, par-

ticularly if it is followed by skilful massage. It is very indiscreet on the part of a physician to promise a cure to these elderly patients. He should tell them perfectly frankly that the process in the joint is merely one phase of growing old and that they must learn to adapt their mode of life to the situation. He can promise them relief from pain and considerable comfort if they will follow directions, and these directions should have to do chiefly with the application of heat and rest to the affected part. I often tell my patients that they should live in an atmosphere of heat—warm rooms, warm clothing, warm bed and warm baths.

What shall we say about climate and the various cures? Once the various etiological factors have been determined and the necessary corrections made, both types of arthritis, that is both the infectious and the degenerative, are better off in a warm dry climate. New Mexico and Southern California offer the ideal environment, but unfortunately comparatively few patients are able to make the journey for financial or other reasons. In my experience it has been very difficult to prognosticate about the value of cures. Some patients go to Hot Springs or Mount Clemons and return much improved. Others come back discouraged and a good deal poorer. My favorite of the foreign resorts is Aix les Bains. How seldom, however, we actually witness a complete and permanent cure from a sojourn at one of these cures! The patient returns feeling greatly improved and in the best of spirits, but after a few months in the old environment the joint symptoms return. The most provoking and discouraging feature of arthritis is its tendency to relapse. I can recall a number of patients who appeared to be entirely cured of arthritis by a tonsillectomy, but who after a year or two again developed symptoms even though the tonsils had been cleanly removed. No one should ever report favorably on a therapeutic procedure for arthritis until the patients in question have been followed up for at least three years after the completion of the treatment.

In closing, then, we may say that the best friends of the elderly arthritic are rest, heat and aspirin. The orthopedic surgeon can often be helpful in giving support to the joint which is under continued strain. Many of these patients object to bandages and apparatus, and find from experience that rest is more practical than apparatus. Perhaps not the least valuable adjunct is a cheerful and philosophic point of view, which accepts stiff and grating joints as merely one of the penalties for achieving old age.

TRAUMATIC SURGERY AND THE PROBLEMS OF AGE ¹

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That an aged person is a poor physical risk is so axiomatic that no contrary argument is needed, and in no field of medicine or surgery is this truism more applicable than in traumatic surgery.

An old person sustaining an injury apparently superficial or trivial becomes a subject of concern to the doctor because the element of physical and mental shock is a more important factor than in a middle aged or young person. Again the mere matter of placing an aged person in a recumbent position may induce enough pulmonary stasis to cause early fatality. Many of these old people are like a storage battery which each day is able to start the motor and keep re-charging by a not too active turning of the wheels. But like an idle battery, they soon run down if the physical and mental stimulus of their daily duty is interrupted.

Of course in using the terms "old" or "aged" we are thinking in terms of years; but we all know patients of 65 who have the vigor and push and vitality of patients of 45. What then is the aged patient? To me a patient is not as

¹ Delivered October 5, 1928.

old as his arteries, but rather as old as the neck of his femur for with old people that seems a vulnerable part of the anatomy. It has been said by our medical colleagues that "Pneumonia is the natural end of the aged," and paraphrasing that, a surgeon dealing with the aged injured could truly say "Fractured neck of the femur is the natural end of the aged injured."

If we briefly survey the field of injuries, we soon realize that old people, like their juniors, are liable to injury from three main sources: namely, transportation, industry and ordinary pursuits. In olden times, war was the great injury producer. Later, industry with a host of mechanical devices was the chief factor. Still later the railways became the leading source. But now the automobile is the chief element not only in urban but in suburban communities. The World War made of our profession a group of specialists organized to care for the injured. That experience showed how deficient we were in the care and treatment of trauma, particularly in the treatment of compound fractures. The Surgeon General of the Army is stated to have well said that there were hundreds of our surgeons in France who were masters in gastro-enterostomy, but only a few score with equal skill in caring for the wounded. There can be no question that in medical progress, traumatic surgery has lagged while other types of surgery have progressed. Fortunately there has been an awakening because of the increasing frequency of automobile and other accidents, and now most hospitals are being so staffed that the seniors and not the juniors are in charge of this kind of service. We are on the way to recognize that a broken thigh is just as much an emergency as a broken appendix.

In the aeroplane age just appearing on the horizon, the field for traumatic surgery will be still further enlarged, and it does not require much prophecy to predict that the next great advance in surgery will be in the treatment of the injured.

In old people, as in others, wounds, burns, joint trauma and fractures constitute about 75 per cent. of the lesions encountered. Before we discuss any of these let us again remind ourselves that in this group of the aged we must focus our attention on the individual rather than on the injury; we treat the person rather than the part.

Let us not forget two elements in our approach to the aged injured; one, the physical and psychic shock, and two, the lack of what Osler so well called "vital rubber." Thus we start our therapeutic journey with a handicap, and if the old model is to carry through, we must manage to drive with skill, especially when the going is rough and the traffic is crowded. Not too fast nor too slow; at a leisurely gait. Not shifting gears too roughly nor needlessly jamming on the brakes. Coasting when we can, and idling along in neutral when the going is bad. Well, say you, that's all right for the old Tin Lizzie or Old Dobbin, but it does not apply to an old man or an old woman. But, I differ, for after all the human machine responds to the skilled touch, to the firm but gentle hand, to the experienced guide who knows how to avoid the rough places and who is adept in times of physical and mental stress.

Be gentle then with this old model; temper your driving of it to its capacity and humor its special peculiarities which are the outgrowth of years of service.

And now for some familiar precepts in the management of special injuries among the aged.

WOUNDS

The principle of partial or of delayed suture is most important. It should be axiomatic that every wound not made with surgical intent is already infected and should be so regarded. If this be true, how important it is to adequately sterilize accidental wounds by the liberal but gentle use of soap and water. We should not rely on antiseptics however actively they are recommended or appealingly advertised. We know from abundant experience that each decade reaches a furore for some

special kind of germ killers. The carbolic of the distant past was succeeded by the bichloride of several decades ago. Then in the decade just passed the chlorines were in the ascendant here when they had fallen into disuse in France where they originated.

The Dakin's solution of our day was in effect the Larbarraque's solution employed by Baron Larrey, who was Napoleon's surgeon in the war of 1814. Just now we are in the throes of another era of antiseptics and we are asked to believe that the germs of our generation can be pestered to death by some gay colors. Red seems to be the first on the list, and many a patient comes to us now a medley of an Indian chief and a futuristic nightmare. Some of the profession are seeing red, they are Bolsheviks in their advocacy of this mercurial, forgetting that long ago we abandoned bichloride because it was dangerous as well as useless. This wound rouge, however, has entered the sunset stage also and in a few years will join the oblivion of many less livid hued predecessors.

If we must use an antiseptic, and for first aid I suppose we must, let us stick to iodine or permanganate which have been standard for years.

Soap and water are the best cleansers and we can safely rely on these when they are available. In the aged it is especially important not to use any strong antiseptics.

Next suturing: It is much better to place the sutures and leave them untied until the second or third day, in the interval covering the wound with a sterile dressing. Any infection will develop during this waiting period, and if none appears after this lapse of 48-72 hours, we can have the reasonable assurance that all is well.

If we do suture, let it be loosely and let us always drain. To be sure many cases heal kindly without any such bothersome precautions; that is true, but it is also true that many develop a serious cellulitis. In an old

person neglect of these precepts, even in a simple scalp wound, may convert an incident into a catastrophe.

Burns exact a fierce toll at the extremes of age, and we all of us dread a severe burn in a child or in an old person. The shock is more profound, the reaction is slower, the reparative properties are lessened. We regard burns as wounds due to thermal, chemical or electrical contact. This means that the treatment is in keeping with wound therapy and hence we do not smear on unsterile remnants or discards like carron oil or greasy salves. Nor do we apply an impervious dressing of the paraffine type unless the burn is of a minor grade. There are three stages in the life history of burns or of any other trauma. One the stage of *onset* or the *inflammatory* stage characterized by redness, swelling, pain. Second the stage of *progression* or the *secretory* stage characterized by exudation of serum or pus or both. Third the stage of *subsidence* or the cicatrizing stage characterized by scar tissue formation with or without contractures.

These you say are the stages of any inflammatory process. Yes they are; and because they have phasal manifestations of different sorts at different stages it is important to modify treatment accordingly. Our plan has been to treat the first stage by wet dressings of sod. bicarb. (5-10 per cent.). This is continued usually for 3-4 days. Then a dressing of sterile olive oil and camphorated oil (equal parts) is substituted. At this stage, the exposure of the part to the rays of the sun or to electric light is also practiced. This "Exposure" treatment lessens absorption, promotes exudation and decreases temperature. The final stage is often hastened by covering the area with a dressing of scarlet red ointment, one dram to sterile olive oil one ounce. Continuing the "exposure" method at this stage is good practice.

Now in old persons, shock and pain need prompt attention. We force fluids; we resort to transfusion if needed. Morphine is used often enough to prevent pain, and luminal is used to allay restlessness. At all stages,

we mobilize the parts to avoid postural contractures. We do not favor débridement of the burned area in the aged; and as a matter of fact that procedure has a limited value in patients of any age. The tannic acid method by which wet dressings of this substance are applied is excellent for body burns involving a large surface. This is virtually a method of chemical débridement because the burned area dries up and exfoliates.

Joint Injuries. The penetrating wounds of joints are serious affairs at any age; but in the old patient a septic arthritis is likely to lead to amputation or death. Osteoarthritis activated by injury may become a very difficult problem especially if it affects the lower spine or the knee. The appraisal of responsibility is another matter of importance. For example it is obvious that the osteophytes in this X-ray film are of long standing and that they are evidences of hypertrophic osteoarthritis. This patient, however, says he has never had any pain in his back until he was knocked down by this automobile. How much of his trouble is old, and how much of it is new, and how much of it is chargeable to this trauma? This brings up the whole question of a single trauma, one accident, acting as an aggravating or accelerating element of an old or quiescent ailment. Can a blow on the chest upset the rhythm of an aged cardiac and cause decompensation? Can a minor bruise on the toe of an old diabetic be the cause of the subsequent gangrene and necessary amputation? That patient with established endarteritis of both legs says a recent bump on the shin caused an ulceration that you know may lead to amputation of the thigh. Did it?

Or those cases of malignancy, superficial as well as deep, that are alleged to be solely or partly traumatic in origin. What is to be our attitude as to these?

We approach the solution of these problems by first of all asking ourselves—What usually or ordinarily happens under the given set of circumstances? In other words, we rely on past experience of our own or others.

In answer to this self propounded inquiry we usually find that an injury of the type described has little or no effect on a chronic or latent ailment. If that be true, then we go on to determine whether or not the ailment in question is characterized by periods of accession or remission, and by continued but perhaps unrecognized progress.

In addition we take note of the "time element;" when did this aggravation occur in relation to this injury? From a clinical standpoint is the connecting linkage adequate? Has the progression of the disease been unusual or is the flare of an accepted type?

Finally if there had been no history of injury, is there anything in your present findings that would lead you to suspect something beyond the ordinary signs of the disease in question?

If now you believe the injury did aggravate, accelerate or activate the ancient disease, you must be prepared to estimate the degree and duration of this advancement, for many of these accident cases bring up medico-legal questions. How much deformity; how much disability? In old people this is a difficult matter to appraise because of their inability at their time of life to seek or obtain other gainful employment in the presence of a physical handicap due to injury. Their period of convalescence is necessarily longer and their recovery is less likely to be as complete as in a younger person.

A decision by a physician entails much careful thought and complete knowledge of all the facts in the case. Our own plan is to allot 60 per cent. for *function* perfectly restored, and 20 per cent. each for perfect restoration of *union* and for *contour*. By *function* we mean ability to perform; by *union* we mean the state of repair; by *contour* we mean the external appearance. In other words we judge our end result in measurable terms based on the two essentials of *actions and looks*. They judge cattle or dogs by the same standard of arbitrary values, and I submit that we should be able as physicians to agree on some

set of standards so that our opinions will cease to be individual guesswork. How much better to agree in terms of figures than in terms of adjectives or adverbs. You call the result good; I might call it fair for our standards are not the same and never can be unless we previously adopt the same elements as determinators.

FRACTURES

Naturally fractures of the lower extremity arrest our attention first; and of these fractured neck of the femur claims first place.

When an old person has a broken bone there are certain important steps in treatment, and these may in part be listed as follows:

(1) *General physique.* Is this particular patient capable of enduring the usual regimen for the injury he has sustained? Can any anesthetic be administered? Is this a case for mobilization or immobilization? Can this patient remain recumbent? Is there any contra-indication to skeletal traction, or to open reduction? Do we here and now resolve to treat the individual and relatively disregard the injury? Let us make no mistake at the outset by rating our patient by the calendar of years rather than by a reaction of tissues. My patient of a year ago with a fractured neck of the femur was by the calendar nearly 92 years old; but she was up and around in a walking calliper 14 weeks after her fall.

(2) *Type of Fracture.* Is it a Type I? That is do the fragments overlap. If so then our plan of treatment differs much from our procedure in a Type II case in which there is no overlapping. There is as much difference in the management of these two types as there is in the management of a catarrhal appendicitis and a ruptured gangrenous appendicitis.

(3) *Surroundings.* Is this patient to be home-treated or hospital-treated?

The psychology of the sickroom is a factor for most patients; for an aged person it may well become one of the deciding factors. There are many spry old ladies of 70 who have never been under the care of a doctor except for a few days at each child birth. They are made up of a combination of rubber and steel springs; they have been present at the birth and death of every grandchild; they are more active than their youngest daughter; they never in their lifetime weighed more than 120; they are the wrens of our practice as compared to the wise owls or old crows.

Put a patient of this perennial flapper type in bed and you by that act lower the morale to a visible degree. By contrast take the fat feeble septagenarian who has lead a heltered life; who has avoided drafts; who has not ventured out in the night air; who has had a selected diet; who is constantly under the care of doctors. This patient is certainly not the wren type; no, that is a bird of another plumage or vintage—not infrequently a parrot. One of these, with identic injuries, you treat like a doughboy; he other like a decrepit.

Let us be very careful then so to treat the injured part in a way acceptable to the individual patient. Our splintage must not be cumbersome—we will avoid circular casts or casings—so far as possible we will apply only removable apparatus so that these aged tissues may be subjected to frequent inspection.

We will treat more of our fractures of the hip in traction and suspension and far fewer of them in abduction or other plaster of paris casings or casts. To me it seems remarkable that so many of us long adhered to plaster of paris spicas in fractured hips when most of us long ago discarded immobilizing dressings in every other joint because they kept the joint inactive so long and thus retarded circulation and delayed repair and convalescence. Yet the hip, more than any other joint, needs conservation for there is a quadrilateral area of the neck of the femur which when broken never perfectly repairs. It is like

the spinal cord in that respect. This is the area affected in the fractures of the base of the neck, the intracapsular variety. The others, those outside the base, the extracapsular, are in reality high fractures of the shaft of the bone with a prognosis more like shaft fractures.

I am convinced that Type I intracapsular fractures almost invariably repair by a sort of spontaneous reconstruction operation in which the fracture line fades out and the trochanteric line and the anatomical neck blend or fuse. The same thing happens with similar sort of bone as in the body of the vertebra, the os calcis, the lower end of the radius. It is a structural inability to repair; it is cancellous bone crushed and devitalized. In the neck of the femur, this desiccated bone literally stews in its own juice (blood and serum and macerated muscle) in a vacuum under a pressure of many pounds at a temperature of nearly 100°. Is it any wonder that under such conditions the neck disappears in some cases as early as six weeks?

There are then certain rules and regulations governing the management of these aged injured, and of these let us not forget that one of the most important is to individualize our patient in terms of tissues rather than in terms of years.

This patient of 70 may be a better risk after an injury than that patient of 45.

And let us not be too prone to give a poor prognosis just because the patient is closer in years to 100 than perhaps we ourselves will attain.

Some of these old models may not have four wheel brakes, chromium plating, Duco paint or rapid acceleration speed from a standing start. But just the same, this old model has gone many miles and is capable of going many more if not rushed into high speed too often.

Finally, let many of us recall that in a decade or two we also will be in the class of the ancients and then let our

surgeon beware if he would consign us to the incurable list just because we had attained three score and ten, or better four score. A woman may be as old as she looks, but a man is never old until he quits looking.

DISEASES OF THE EYE IN OLD AGE *

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Nearly a thousand years before Christ, a great poet—probably Solomon himself—spoke of Age as “the day when the keepers of the house shall tremble, and the strong men shall bow themselves, and the grinders cease because they are few, and those that look out of the windows be darkened.” But age is not always a question of years; for, as Sir Thomas Brown¹ wrote in 1646: “Many grow old before they arrive at age.” Twenty years later, J. Small² voiced the earnest desire “that Physicians would study the Geroncomical part of Physick more than they do.”

Age alone is not sufficient reason for diagnosing an affection as senile. I have seen people over ninety years of age whose eyes, in many respects, were youthful; and, conversely, persons under forty with eye lesions similar to the changes of senescence. Therefore, it is not wise to diagnose an eye lesion as senile until all toxic sources have been excluded. This is especially important because of the lowered resistance in persons of advanced age. In this connection, MacCallum³ has written the following very significant sentence: “With the advance of age, wasting becomes evident in many organs, if not in all, although the inconstancy with which it appears leads one to wonder whether other factors play a part.”

Therefore, I will consider briefly, some of the most important senile changes that take place in the various tissues of the eye; some of the affections arising from these

* From the Johns Hopkins Hospital, Wilmer Institute, Baltimore.

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changes; and, where possible, methods to mitigate the lot of the old person with failing sight.

OCULAR CHANGES IN OLD AGE

EYELIDS

Hippocrates noted that many old people become "hollow-eyed." In fact, there is a tendency for the whole eye to become smaller in advanced age. The muscles of the eyelids become atonic; the skin smoother, thinner, less elastic, folded, producing concentric lines commonly spoken of as "crowsfeet." At times, the upper lid sags so much that vision is interfered with. The lower lid may turn out (senile ectropion), which leads to degenerative changes in the conjunctiva and a very annoying watering of the eyes. Or, the lid may turn in (senile entropion), causing great discomfort from the inverted lashes, sometimes leading to severe conjunctival inflammation, and even to ulceration of the cornea.

OCULAR MUSCLES

Paralysis of the external muscles has been mentioned by several authors as a senile affection; but, in my experience, it is seldom that this condition is due solely to the changes of age.

CONJUNCTIVA

The thickness of the conjunctiva differs greatly in individuals, and it is much influenced by exposure to irritation and intercurrent inflammations. The aged conjunctiva shows atrophy of the subepithelial connective tissue with hyalinization; disappearance of the elastic tissue fibres; and increased thickness of the epithelium with a tendency to keratinization. Throughout life, the conjunctiva is more exposed than any other mucous membrane; therefore, the palpebral portion assumes a red and velvety appearance from enlargement of the papillae. Concretions of dead epithelial cells and hardened mucus form in the epithelially lined depressions, called the glands of Henle.

These accumulations, "lithiasis," look like calcareous deposits, and they frequently feel so to the patient. The ocular conjunctiva often becomes pigmented around the corneal limbus; on either side of the cornea in the space between the eyelids, it becomes thicker and assumes a yellowish color similar to fat. The pinguicula is due to a hyaline degeneration and a local hypertrophy of the elastic fibres. It is more marked in the case of inflammatory redness of the conjunctiva; and, occasionally, it is itself the seat of ulceration. In age, the conjunctiva as a whole becomes less elastic.

TENON'S CAPSULE

Tenon's capsule becomes thicker, less elastic, and infiltrated with fatty masses. (Figs. 1 and 2. Conjunctiva and Tenon's capsule in various decades of life.)

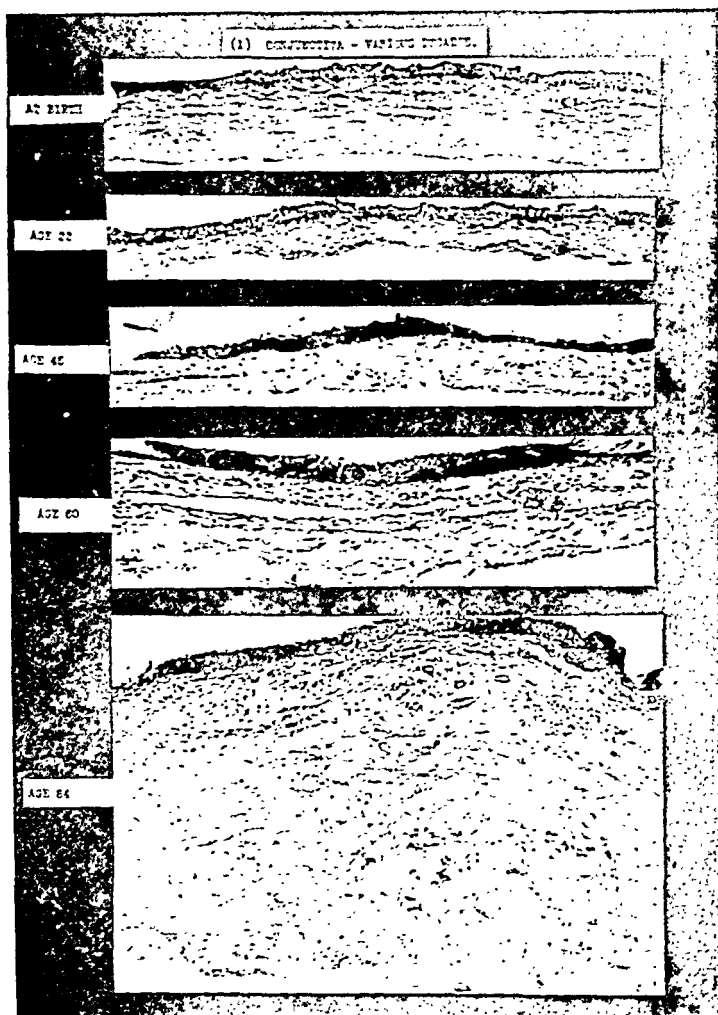
SCLERA

The sclera thickens, becomes more rigid and of a yellowish color. In a word, according to Salzmann⁴ the whole tunica fibrosa undergoes a certain degree of fatty degeneration.

CORNEA

The corneal changes of age have taken on a special interest since the introduction of the slit lamp and corneal microscope. The apparent diameter of the cornea diminishes; it loses its lustre and transparency; and, at times, it flattens, particularly in the vertical meridian, with a change in its relative radii of curvature. Astigmatism "according to the rule" tends to decrease; astigmatism "against the rule" tends to increase; while in emmetropia, slight astigmatism "against the rule" results.

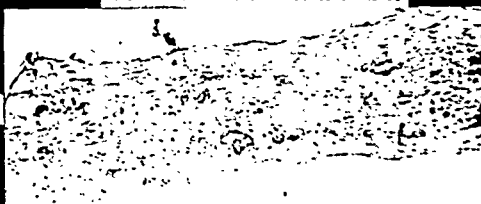
Kistler⁵ has shown that, in dogs, as in humans, the refraction of the cornea grows less with age; and Vogt⁶ has called attention to the increase in the internal reflection of the cornea at a level with Descemet's membrane.



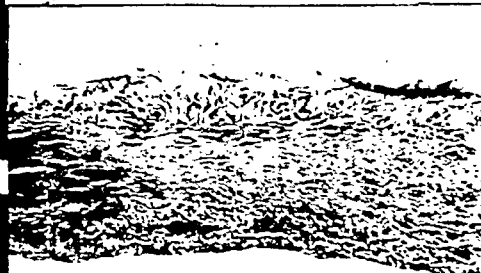
(1) CONJUNCTIVA—VARIOUS DECADES.

(2) TENON'S CAPSULE. VARIOUS DECADES.

AT BIRTH



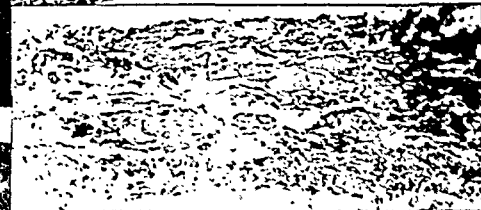
AGE 2



AGE 45



AGE 60



AGE 84



(2) TENON'S CAPSULE. VARIOUS DECADES.

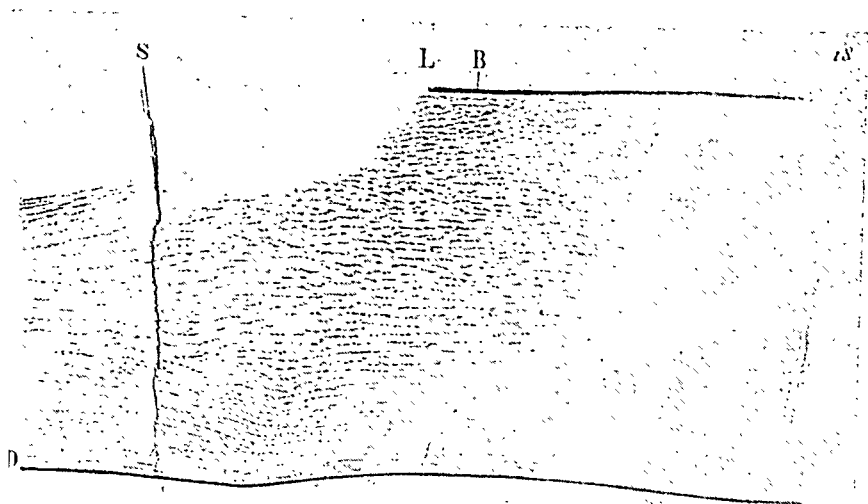
With the corneal microscope, the beautiful mosaic appearance of the endothelial layer becomes less visible; and the cells assume a granular and amorphous appearance. Verrucosities (Hassel-Henle warts) in the periphery of Descemet's membrane, are found in all adults (Vogt⁶). Migrated pigment granules from the iris and ciliary body are seen on the posterior surface of the cornea.

The opaque ring around the periphery of the cornea, called, with poetic license, "arcus senilis" or "gerontoxon," is very interesting. It is more frequent in old age than in youth; but I have seen it very often in persons under forty, when there was some interference with the corneal nutrition, such as "pulsating exophthalmos," etc. This opaque ring is separated from the limbus by a clear band of cornea, because Bowman's membrane, which is always involved, does not extend to the extreme periphery. This clear ring, however, is only superficial; for the opacity, which occupies also the deeper layers, does go to the limbus. The opacity is due to minute oil globules of fatty infiltration. Meesmann⁷ suggests that it should be called "arcus lipoides," because a similar condition appears in young people. He further states that it is associated with increase of cholesterin and other lipoids in the blood. He also calls attention to hypercholesteremia in its relation to the lipoids in the walls of sclerosed blood vessels. A. Fuchs⁸ mentions the fact that feeding animals with cholesterin, causes a whitish ring around the cornea similar in appearance to the arcus senilis. (Figs. 3 and 4, Arcus senilis.)

Fuchs⁹ has described a "senile marginal atrophy (peripheral furrowing keratitis\ of Schmidt-Rimpler) which sometimes appears as a pure senile change. The opacity becomes broader, and its site in the cornea thinner with a distinct furrow. Under the influence of intraocular pressure, the cornea may yield at the point where it is thinnest, and give rise to true ectasia.



(3) ARCUS SENILIS (Man of 67 years).



(4) Arcus Senilis (Microscopic) X 70 From Histopathology of the Eye.

ADELBERT FUCHS.

ANTERIOR CHAMBER

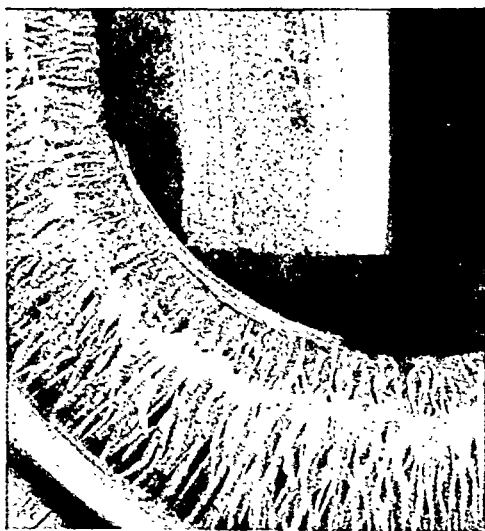
The anterior chamber, which in early life has a vertical distance from the lens of about 2.8 mm. (Salzmann¹), has a tendency to grow more shallow in senescence. This is due to the flattening of the cornea and the increase in the size of the lens. There is also a decrease in the size of the posterior chamber. The change in the size of the anterior chamber has a marked influence upon the occurrence of glaucoma.

IRIS

The iris, in old people, exhibits very striking changes, when viewed with the slit lamp and corneal microscope. There is hypertrophy of the connective tissue fibres, at the expense of the cells (whose protoplasm undergoes degeneration); hyalinization of the iris stroma; sclerosis of the blood vessels with increase of their visibility; and more prominence of the sphincter muscle. In the pigment epithelial layer, there is death of the cells and migration of the pigment granules. These are deposited on the posterior surface of the cornea, anterior surface of the lens capsule, and anterior surface of the iris. By transmitted light, those granules appear like minute, dust-like, particles of black pepper; by direct illumination, like red pepper.

According to Hinen (quoted by Koby¹⁰), in the fifth decade, the stroma suffers most frequently (55.9 per cent., the border and posterior layer each 9.5 per cent.); in the eighth decade, the stroma and the pupillary margin are affected in all cases, and the posterior layer in about 85 per cent. The pupil border, where the pigment has disappeared, looks homogeneous like a glass membrane (Fig. 5.) The iris, as a whole, becomes thicker and more rigid. From these alterations, the pupils of old people become smaller and less mobile; and the color of the iris, especially blue ones, changes to a lighter hue.

In people over 75 years of age, I frequently find, in addition, the remains of a quiet iritis unnoticed by the patient.



(5) ATROPHY OF PUPILLARY BORDER
(Slit Lamp). 81 Years

Before the days of the slit lamp, this condition was probably often overlooked. Even with our modern aids to diagnosis the study is much simplified by the use of a mydriatic.

CILIARY BODY

In the ciliary body, similar degenerative changes take place. The thickening of the connective tissue elements causes an encroachment upon the circumlental space; and influences the function of the processes so important to the nutrition of the lens and vitreous.

VITREOUS

According to Marzio¹¹, rarefaction and shrinking of the vitreous fibrils occur; and Vogt⁶ says that the senile framework shows increased luminosity, and that the tunic-like vertical folds are especially visible and bright.

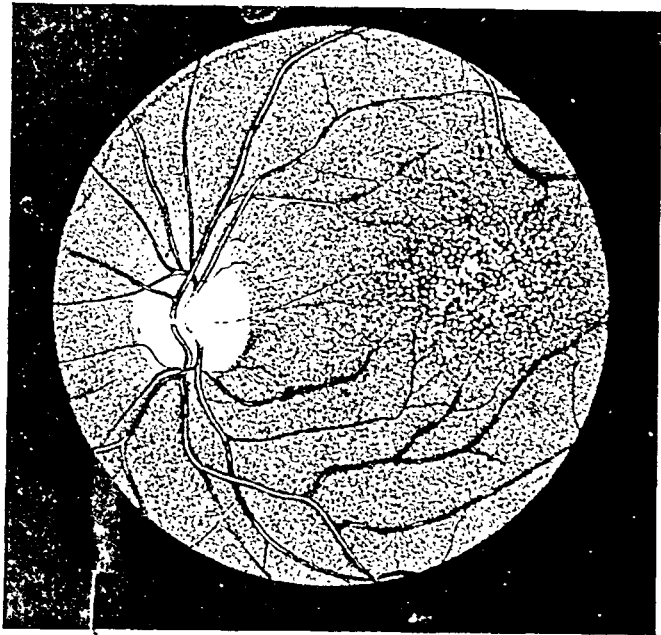
FUNDUS

In old people, the retina takes on an epithelial character with loss of transparency and lustre; and diffuse, or circumscribed atrophy, affecting the pigment epithelium, gives rise to a tessellated appearance.

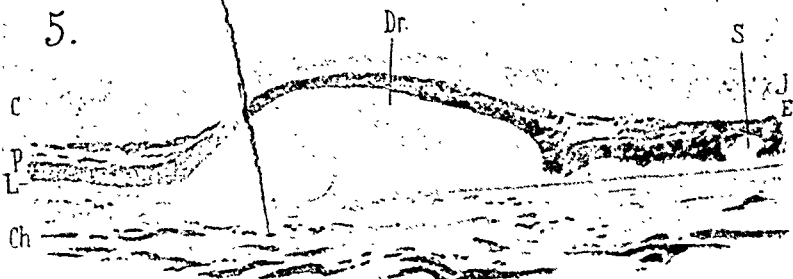
Terrien¹² states that, in old persons, destructive vascular lesions of the retina are rarer than in the vessels of other organs; but he agrees with many observers in regard to the vulnerability of the macular region. Cystoid degeneration of the retina is a common senile manifestation; but this change usually takes place in the extreme periphery, and is of little visual importance. The condition is usually a postmortem discovery.

There is usually sclerosis of the chorioidal vessels, which causes a stiffness and rigidity of this layer. Small warts or verrucae, on the surface of the chorioid, are commonly described as a senile change. It is true that the disturbed vascularity of age does cause them; but they also occur earlier in life under similar nutritive disturbances. To illustrate this, I am showing the fundus picture of a colored woman of 47, who was suffering from a number of bodily ailments. (Figs. 6 and 7.)

In regard to senile central chorio-retinitis, Fuchs⁹ says that it occupies a position midway between a degeneration and an inflammation. Many authors (Coppez & Danis¹⁵, Harms¹⁴, Van der Hoeve¹⁵ and others) have described a senile macular degeneration of the retina. De Schweinitz¹⁶ mentions a senescent angiosclerosis of the fundus, which differs from the usual changes of arteriosclerosis by the retention of the regular vessel lumen, and absence of arteriovenous compression, but with a pale disc. In my experience, these changes are much influenced, even in the aged, by focal infections and toxemias. De Schweinitz, with other authors, describes a senile macular affection under the title of "retinitis atrophicans centralis."



(6) Woman, colored. Age 47. Colloid excrescences of lamina vitrea of chorioid (so-called Druse, Hutchinson's disease, Guttate or Tay's Chorioiditis).

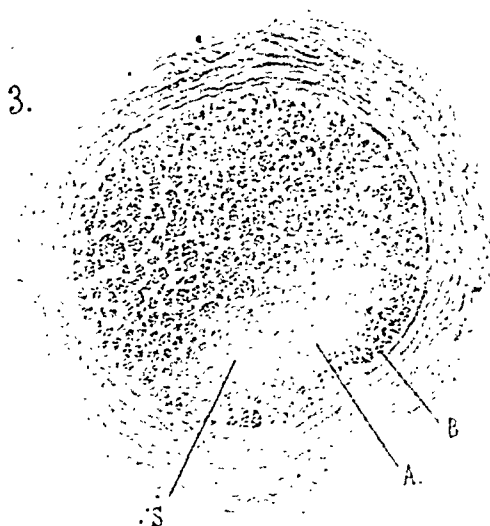


(7) Colloid Excrescences of Lamina Vitrea (Microscopic) X 250. From Histopathology of the Eye.

ADELBERT FUCHS.

OPTIC NERVE

In addition to the fundus conditions already described, there occurs more rarely (and not easily recognized) a partial atrophy of the optic nerve. De Schweinitz says there is a "type observed in elderly people characterized by atrophic pallor of the optic nerve, without shrinking, sometimes associated with senile retinal sclerosis." In these cases the central vision may be reduced very little, and the visual fields only slightly contracted. Fuchs⁹ says that in such cases, there may be an impairment of vision with very little ophthalmoscopic change. The condition may be due to a blocking of a small nutrient vessel in the nerve, with a localized atrophy. A. Fuchs⁸ describes such a case in a man of 70 years. The patient died from leucocythemia and the optic nerve condition was discovered incidentally. (Fig. 8. Illustration from Fuchs' Histopathology.)



(8) Senile Atrophy of Optic Nerve (Partial-Microscopic).
X 20. Pal-Weigert Stain. A - Atrophic Focus. From
Histopathology of the Eye.

ADELBERT FUCHS.

Fuchs⁹ has called attention to the fact that a partial atrophy of the nerve may be due to actual pressure upon its delicate fibres by a sclerosed internal carotid, or ophthalmic, artery.

LENS

The senile changes of the crystalline lens, when studied by the aid of the slit lamp, are so interesting that one is tempted to give too much time to this structure.

In general, age tends to produce a shrinkage in the tissues and organs of the body. Quite different from this rule, is the behavior of the lens, which continuously grows larger through the whole of life; the increase in diameter may amount to 1 mm. and a trifle more in thickness. As Salzmann⁴ very graphically states: "One can deduce the form of the senile lens from that of the youthful lens if one thinks of it as surrounded by a shell some 0.5 mm. thick." The margins of the lens become more rounded. The cells of the anterior lens capsule are cubical in youth; but later on in life they become flattened out by the pressure of the enlarging lens. They may shrink to such an extent that little more than their nuclei can be seen on the inner surface of the hyaline membrane (Collins & Mayou¹⁷). This membrane becomes uniformly thickened with minute colloid deposits.

Time will allow the consideration of only some of the more important changes recognized in the living eye by means of the slit lamp and microscope. There is increase in the internal diffuse reflection of light; the surface of the adult (senile) nucleus becomes more marked and its lamellae more distinct; according to Meesmann a buckling forward of the seams of the lamellae causes variously shaped prominences. If the beam of light is thrown in the eye very obliquely it makes more clear the shadows of the protrusions. Similar changes take place on the posterior surface. The lens becomes fluorescent and assumes a yellowish color. This tint becomes so marked in the posterior layer that the beam of light takes on a dark orange hue. The coloration is really greater in the nucleus; but

the light rays reflected from the posterior capsule have to traverse all of the lens to reach the eye of the observer, and each layer adds to the depth of color. By reflected light in the miosis of age, this change give rise to a yellowish gray appearance of the pupil, which might be mistaken for cataract. There is also greater absorption of the spectral colors, particularly the blues and greens, which results in reduction of the normal color perception for the blue end of the spectrum.

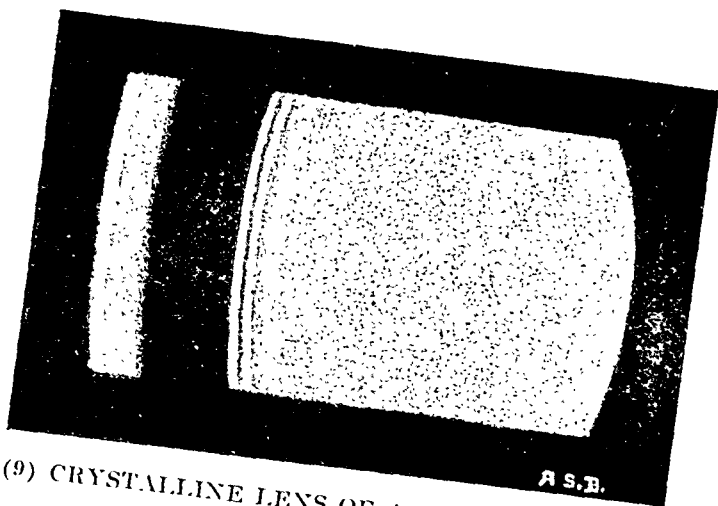
From early youth, the nucleus increases in size and hardness; until in advanced age, as a result of this process of dehydration and sclerosis, the lens is practically all nucleus, and inelastic like old rubber. (Figs. 9 and 10.) As Shakespeare's cynical Jacques says, "and so from hour to hour we ripe and ripe, and then from hour to hour we rot and rot."

PRESBYOPIA

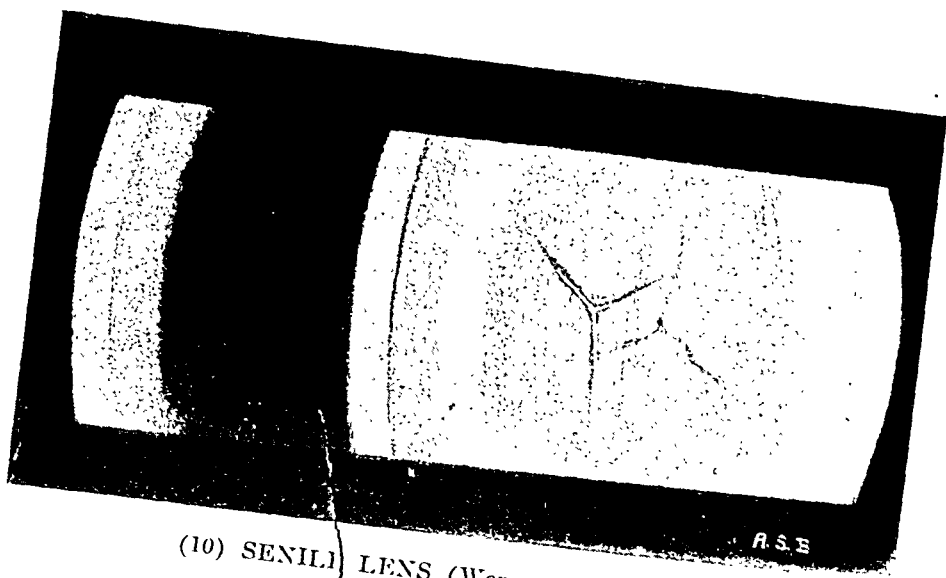
The above described changes give rise to presbyopia, the senile failure of accomodation. This failure is not due to diminution in strength of the ciliary muscle, but chiefly to the inelasticity of the lens and decrease in its index of refraction, supplemented, perhaps, by shrinkage of the coats of the eye, by flattening and lessened refractive power of the cornea, advance of the focus by miosis, etc. In very old people, the lens acquires a double focus; so that the presbyope reads better in a brilliant light owing to the reduction in the circles of dispersion by the contracted pupil, while the reverse is true of the majority of people with cataract who require greater amount of light afforded by a larger pupil. As a precursor of cataract, the index of refraction of the lens is occasionally increased producing "second sight," and allowing the person to lay aside his reading glasses. I have observed this phenomenon in several generations of a family.

CATARACT

The senile lens is subject to the development of a great many kinds of opacities—cataract.



(9) CRYSTALLINE LENS OF A BOY OF 10 YEARS.



(10) SENILE LENS (Woman of 71 Years).

When published, the Fourteenth Decennial Census of the United States¹⁸ will state: "After 64, cataract becomes the foremost cause of blindness, being responsible for 34.1 per cent. of all blindness at that time of life." . . . "Almost one-half of the blindness resulting from cataract occurs after 64 and nearly three-fourths after 44, or after the prime of life." According to Vogt⁶, "more than 90 per cent. of all individuals over 60 years of age show senile lens changes of various degrees." Jackson¹⁹ found that in 732 patients, over 50 years of age, who consulted him for all kinds of eye trouble, 53.4 per cent. showed lens opacities. From this series with an average of 65.35 years, Dr. Jackson says: "The probability is that under proper hygienic care it will be twenty years before the cataract becomes mature and fifteen years before he loses the power of reading ordinary print." There is a great difference shown by the various types of lens opacities in their tendency to increase. For example, spoke-like opacities in the cortex, tend to increase more rapidly than nuclear ones.

In addition to the lenticular changes mentioned, in cataract there is hydrolysis of the lens protein with the formation of tyrosin and cholesterin.

The most probable cause of cataract, according to Parsons²⁰, is the nutritive disturbance of the lens due to general faulty metabolism, possibly from the formation of specific autocyctotoxins.

GLAUCOMA

The census report already mentioned, will say: "Glaucoma is also distinctly a disease of later adult life, nearly one-half occurring between 45 and 64." . . . "From 45 to 64 (late middle life) glaucoma percentage increases, more than trebling." . . . "Glaucoma registers a great increase, the proportion in 1920 being nine times that for 1890 and about one and a half times that for 1910 (increase in number of aged in general population)." After thirty, its rela-

tive incidence increases with every decade, and its importance is enhanced by its being a bilateral affection.

Some of the age factors in the development of glaucoma are: the increase in thickness and loss of distensibility of the sclera; enlargement of the lens; lessened size of the anterior chamber, which causes a decrease in the filtration angle and a pressing together of the meshes of the ligamentum pectinatum; sclerosis of the ciliary processes and their encroachment upon the circumlental space. Under these conditions, any further reduction in the filtration angle may induce glaucoma. For this reason one should be very cautious in the use of a mydriatic in old people. In the beginning of senile cataract, there may be considerable swelling of the lens. These changes have been very aptly summarized by Priestly Smith²¹, who says that, in some cases, the lens becomes too big for the eye. These senile manifestations are more liable to give rise to glaucoma in the smaller eyes of hyperopes than in others.

There is probably a change in the character of the aqueous in old age, as there is in the secretion of the ductless glands. Perhaps, the decline in the secretion of the suprarenal renders the eye an easier prey to glaucoma. Vasomotor disturbances are of serious import. Some years ago in the course of a few hours I saw two elderly women with acute glaucoma. In one case, the attack was caused by the shock of the announcement of the sudden death of a brother; in the other (a person who was dependent upon clerical work for a livelihood) by the joy of a telegram bringing the unexpected news of a good annuity!

THERAPEUTICS

Drooping of the upper eyelid becomes so great at times, that in reading, the lid has to be raised by the fingers, or by a support mounted on the upper rim of the spectacles. It is easily cured by cutting out a strip of skin as long as the lid, and 4 to 5 mm. wide. A local anesthetic is used, and the wound is closed by a subcutaneous stitch of very fine silk.

Senile ectropion, in mild cases, can be relieved by the simple method of galvano-puncture, as suggested by Ziegler. Strict aseptic precautions, and a local anesthetic should be used. After the eyelid is firmly fixed with a lid clamp, a number of punctures are made on the conjunctival surface, about 4 mm. from the lid margin. I get the best results by placing the punctures very close together (2 mm.). This cauterization is usually sufficient in the relaxed tissues of old people. However, there are a number of more formidable surgical procedures for shortening the lid, which are satisfactory.

In both entropion and ectropion, only the lower eyelid is usually involved. Temporary relief can be obtained by the use of collodion or strips of adhesive plaster. For a cure, I will describe a method simpler than a more formal surgical procedure, and one that has never failed when properly carried out. Butyn 1 per cent. is instilled in the lower cul de sac, and the skin surface is anesthetized by the injection of 1 to 2 c.c. of 1 per cent. solution of procain containing 4 minims of adrenalin to the ounce. A stick of caustic potash is sharpened on a piece of wet sterilized blotting paper. After the insertion of a spatula, the skin surface of the lid is cauterized by the caustic pencil with a gentle stroking motion parallel to the lid margin, and about 4 mm. from it. The skin should be perforated, and the width of the cauterized surface may vary from 2 to 5 mm. The caustic action can be stopped, when desired, by an application of a 1 per cent. solution of dilute acetic acid, or by vinegar. During the procedure, the lid returns to its proper position and remains there. The wound may be covered with bichloride salve 1 to 10,000. A bandage is unnecessary. Considerable reaction immediately follows this proceeding; but it quickly subsides under ice applications; the patient is not laid up; and no appreciable scar results. The operation can be used without shock, in the case of very old or infirm people; and it is applicable before a serious intra-ocular operation, when the patient is suffering from the annoyance of the inturning lashes.

Lithiasis sometimes occasions much discomfort, giving rise to a feeling of cinders in the eye. These concretions should be incised singly with a very sharp pointed cataract knife, and the accumulated masses removed by a minute curved foreign body spud. With the use of butyn and adrenalin, the procedure is painless.

Pinguecula in old people does not require treatment, except in those cases where it becomes inflamed or ulcerated. When this occurs, the condition quickly subsides under a simple treatment of irrigations with a 3 per cent. solution of boric acid, the application of $\frac{1}{2}$ per cent. solution of silver nitrate upon a cotton applicator, and the bed-time use of acriflavine.*

Furrowed keratitis, in the aged, is fortunately not very common, according to my experience. But it can be relieved by attention to the general bodily condition; locally, by irrigations several times a day with a boric acid solution, followed each time by the acriflavine. In some cases a pressure bandage between treatments, is helpful.

IRITIS

The quiet iritis, so often seen in the aged, requires treatment that does not differ from that used in younger people. But in completing the diagnosis, a mild mydriatic is very helpful. In these cases, and for ophthalmoscopic examinations of the fundus, a 5 per cent. solution of ephedrin is usually sufficient; but a combination of this drug with an equal proportion of a 5 per cent. solution of euphthalmin makes a satisfactory mydriatic. However, in all old people it is wise to contract the pupil after the examination, by a half per cent. solution of pilocarpin.

RETINA AND UVEAL TRACT

In the case of lesions of the uvea and retina in old people, it is particularly important to make a thorough survey to exclude all bodily toxic sources. Among the aged,

* One part of a 10 per cent. solution of acriflavine in alcohol, to 1500 parts of refined castor oil.

the teeth and intestinal tract should be especially considered; and examinations of the blood and urine are also most important. After the removal of all discoverable causes, rest of the eyes, protective glasses, hot applications, a long continued bed time use of a mild solution of dionin, are helpful. In inflammations of the anterior uvea, the treatment does not differ from that indicated in youthful subjects, except in the greater caution necessary in the use of mydriatics.

OPTIC NERVE

Partial atrophy of the optic nerve as a purely senile manifestation, is rare. The only help available is through the improvement of the bodily condition, and amelioration of the cause.

PRESBYOPIA

One of the greatest boons vouchsafed to humanity, has been the production of lenses. Without their aid, Hawthorne's words would fitly describe the fate of many senescents: "So age-worn and woful are they." There are many practical points worth considering in prescribing presbyopic glasses; but only a few of the most important can be mentioned. The lenses should be carefully adjusted for the distance at which the person desires to use his eyes. That distance varies greatly in musicians, the clergy, artists, typists, clerks in stores, mechanics, etc. It adds greatly to the comfort of old people, at times, to have glasses not only for the distance and for reading, but also for intermediate distances, such as for cards, music, billiards, picture galleries, etc. Particular pains should be observed in properly correcting the astigmatism, which changes with advancing years. The glass should be as weak as possible to answer the purpose. In the first decade of presbyopia, there is a tendency to prescribe glasses which are too strong. This favors the increase of presbyopia, limits the range of ocular efficiency, alters the normal relation between accommodation and convergence, with the result of physical discomfort and reflex nervous

disturbances. This is especially prone to occur, if the individual has a pre-existing insufficiency of convergence. Under these circumstances, the presbyope may have discomfort with his new glasses, in spite of their not being too strong. Converging exercises are very helpful. In the case of hyperphoria, the appropriate prisms in the glasses give comfort; but prisms base in, or out, should be prescribed only as a last resort.

After forty-five, one who is under a great nervous strain, or, who has to use his eyes very strenuously, often suffers from various reflex symptoms, without placing the responsibility upon the eyes. No one understood more clearly this relationship than Weir Mitchell, as the following account will illustrate.

In 1899, one of my distinguished townsmen consulted this great neurologist, on account of headaches, insomnia, gastric disturbances, etc. The patient seemed to be in excellent physical condition; and after listening to all the symptoms, Dr. Mitchell said: "I think your troubles come from eye-strain: get the proper glasses for your near work, and, if you are not relieved come back to me." To the ophthalmologist, Dr Mitchell wrote this characteristic note: "Dear _____: "Please Gould & Glover." Dr. Mitchell's diagnosis was promptly verified by the relief afforded by the glasses.

SENILE CATARACT

The dread of the knife and the frequency with which senile contract occurs, lead many people to seek a cure in impossible places. I operated on a very intelligent woman who had previously gone to live in South America in order to use in its native habitat a plant famed for its cure of cataract. Before that she had exhausted the knifeless cures of Europe! I have seen patients who had tried everything from powdered glass to radio-active lenses at

³ At that time Dr. George M. Gould was writing much about the cure of many ills by wearing glasses.

\$1,000.00 a pair. This class of eager pursuers of therapeutic "will o' the wisps" is by no means composed entirely of the ignorant.

The method of dealing with old people affected with cataract, is one of great psychological importance. I have very frequently examined the eyes of patients in this condition, where they have been most unhappily waiting, in idleness, for a cataract to "ripen" which did not "ripen." Often, old people have been brought to me with the request: "If mother has a cataract, or, any other serious trouble with her eyes, please don't tell her. I fear the effect of the shock upon her health." Invariably, I decline to make an examination without full liberty to tell the patient the actual facts as far as I deem it wise to do so. Very seldom have I found it prudent not to be perfectly frank about the matter. On the contrary, I usually say: "Yes, you have cataract; but that is of much less consequence than many other very serious affections that might cause your blurred sight. It is not likely to increase rapidly, if at all. Should it interfere seriously with your reading, the more advanced cataract can be removed with great hope of success. In the meantime the moderate and proper use of your eyes, will do them no harm, and will make you much happier." In such cases, my experience agrees with Jackson's¹⁹—that "the persons have been as grateful for the removal of their dread as they could have been for the removal of their cataracts." The usual response is: "I am so glad to learn what causes the little blur before my eyes. Now that I know it is not from a serious, incurable disease, I can use my eyes and be happy."

Patients with senile cataracts, form a large part of one's private, as well as hospital, practice; and it might not be entirely without profit to consider some factors which may add to the comfort of this class.

(1) In spite of the person's age, it is wise to make a survey for any contributing bodily condition, with the hope

of removal or mitigation. Teeth, colon stasis, and hyperglycemia are particularly important.

(2) Carefully balanced diet; reduction of meat, carbohydrates and salt; use of green vegetables; and sufficient water between meals.

(3) The treatment of any coexisting ocular lesion, especially of the uveal tract.

(4) Alleviation of senile cataract has been sought in medicine, physiotherapy, serology, radiology. But it is very difficult to correlate the remedy with the non-progression of, or the improvement in, the lenticular opacities; for the reason that a large proportion of senile cataracts either progress very slowly, or remain stationary. But a mild solution of dionin over a long period, and hot applications followed by cold, may be used with the hope of aiding the nutrition of the lens.

(5) If the opacity is central, and there is no indication of glaucoma, a mild mydriatic improves vision by admitting more light. In such cases, I advise a 1 per cent. solution of homatropin combined with a 5 per cent. solution of ephedrin, to be instilled in the eyes every morning, with the permission to use an extra drop in the afternoon on special occasions.

(6) In advanced age, the miosis and rigidity of the pupil increase the visual impairment caused by the cataract. In such cases, even when there is a tendency to glaucoma, much comfort is rendered by a very simple reading slit of black rubber, 6 x 4 inches. In its center is an aperture 4 x 1/4 inches. It is thin, very light and can be easily moved down the page while reading, the aperture making clear all of the print within its space. It lessens pupillary contraction which is caused by a large white reflecting surface; gets rid of blurred secondary images; reduces irregular astigmatism and spherical aberration. Like the mydriatic, this sometimes makes reading possible for persons too ill or infirm for an operation, or renders an operation unnecessary. In other cases, it enables one to

read until the cataract can be extracted. Nearsighted persons can use the slit without glasses; the farsighted can use their regular reading glasses in addition. The ordinary hand magnifying glass or the newer telescopic lenses may give added help (Fig. 11, black rubber reading slit).



BLACK RUBBER READING SLIT IN USE.

(7) In old people, as in younger ones, the ophthalmologist is confronted with many cases in which the lens becomes too opaque for useful vision, although the cataract is not mature in the usual sense of the word. In the aged, the problem is simpler than in youth; because practically the whole lens is hard, and it may be extracted by the usual combined method, or in capsule. In case there is some soft cortex, and the lens is extracted without its capsule, the proceeding is rendered safer by desensitizing the patient to lens protein beforehand if the intradermal test has shown that this is necessary.

(8) Not the least of the therapeutic measures, is the encouragement of the patient to use his eyes under the best condition of print, illumination, lenses, etc.

GLAUCOMA

As already stated, glaucoma chiefly belongs to the later decades of life. It is of the utmost importance to recognize early the acute attack with its accompaniments of general feeling of illness, and distressing nausea and vomiting, which often mask the eye symptoms. It is not seldom that such patients are sent to the surgical wards under the impression that there may be a brain tumor. Such attacks often yield to a hot bath, cathartic, rest in bed, morphin (without atropin), and locally pilocarpin, adrenalin and hot applications.

But it is the insidious, unnoticed, chronic form of glaucoma that exacts such a toll of sight. There is no pain until late, no disturbance of vision. In fact, there is such a lack of symptoms that the discovery of the malady is often incidental, while the eyes are being examined for glasses or some minor ocular trouble. Occasionally, the intelligent patient himself makes the discovery by noticing a contraction of the peripheral vision.

Elderly people, particularly hyperopes, should be taught that the disease is very insidious; and that a regular examination of the eyes, like that of the heart and kidneys, offers the best means of preventing the disaster that comes

when the glaucoma is recognized too late. In such patients, the ophthalmologist should make a particularly careful examination, testing the visual fields as well as the central acuity of vision. In every instance, the intra-ocular tension should be tested with the fingers; and, in case of doubt, with a reliable tonometer. One must also take into account the fact that usually the tension is less in age than in youth. Especial care to exclude glaucoma should be taken when the patient has lenticular opacities; because the "blur" of which the patient complains, may be attributed to the lenticular changes. Unfortunately, we too often see patients nearly blind from glaucoma who have been waiting for stationary opacities to become "ripe."

In a certain proportion of cases, the glaucoma can be controlled throughout the patient's life by the careful attention to bodily conditions, the use of miotics, etc. But if the patient has lenticular opacities in addition, the problem is much more complicated. The miotic may relieve the intra-ocular tension, but it will also make the vision worse by reducing the amount of light that reaches the retina.

If the glaucoma cannot be controlled by the treatment mentioned, one should not hesitate on account of the patient's age alone, to employ the operation appropriate for the individual case.

EPITOME

An ancient philosopher considered "Age itself a disease;" a modern philosopher says that Age, like Youth, is rather a state of mind than a time of life. The latter view is more inspiring to the student of preventive medicine and of the humanities.

Experience teaches that some individuals are comparatively young at eighty, and others are old at forty. A distinguished pathologist, in considering the wasting of the organs in the aged, wonders if factors other than age do not play a part in this process. A noted physician feels

that presbyopia is definitely hastened by intestinal intoxication.

The effects of disease in the young simulate the degenerative changes of age. In the ocular abiotrophies, certain tissues present at birth the appearance of age; or, they may have implanted in them the seeds of premature senility. In youth, a wasting disease may cause one to look "hollow-eyed," with malposition of the lids; there is an arcus juvenilis as well as an arcus senilis; dystrophies of the cornea change its curvature, its translucency, its lustre. Cataracts may be congenital or they may occur early in life from nutritive or toxic disturbances of the lens. Infection may cause uveal and fundus changes not unlike those that are called senile. Inflammations, also, induce the disintegration of the iris pigment epithelial cells, with atrophy, and migration of the pigment granules. Glaucoma may be congenital from a fault in tissue development, or, it may follow intrauterine inflammation. The senile macular affection, "retinitis atrophicans centralis," is simulated in youth by traumatic or inflammatory lesions of the chorioid and retina (so-called "hole in the retina").

Human life is being prolonged by modern science; but, with the gift of these extra years, is linked the burden of the ailments of age—heart lesions, cerebral hemorrhage, nephritis, cataract, glaucoma. To these affections, unemployment is frequently added, and the problem becomes one of economic as well as humane interest.

Those advanced in years are not able to continue the bodily activities of youth; eyesight becomes more precious whether it is needed in gaining a livelihood, or in making less somber the shadows of the "evening of life." It is not possible to present an "elixir of life" or "fountain of ageless youth;" but we can well afford to heed Cicero's admonition, concerning the effects attendant upon long life: "To counteract their progress by constant and resolute opposition, and to combat the infirmities of old age as we would resist the approaches of disease."

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SPECIAL ASPECTS OF NEOPLASMS IN THE AGED¹

(ABSTRACT)

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The greatest incidence of cancer occurs shortly after middle life, there is an increasing liability to cancer up to the end of life and liability to cancer has increased in the last two decades.

Studies do not show that there has been any increased tendency towards cancer in any individuals at any age. They merely show that people are living longer so that the lapse of time permits the expression of whatever tendency to cancer they may possess. The liability of exposure to exciting factors of some cancers, as of skin and lung, may have increased in the past 25 years, but studies do not prove this to be a fact.

The high incidence of cancer in old age is not limited to human beings, but probably exists in all species of animals.

I have been unable to find any report of a study of a large number of cases of cancer in old subjects with the object of determining to what extent the disease was the result of senescence. Cancer in the aged must be regarded as always pathological and not as an essential phase of the process of senescence. Senility merely acts in preparing the soil and rendering the tissues more susceptible to the action of the usual exciting factors, the presence of which is almost as essential as in the earlier periods of life. In general, the cancers of old age pursue a relatively slow course, depending on the reduced metabolism of this age period, but there are many cases which exhibit an unusually rapid growth. In the clinical course of cancers in the aged, secondary infection plays a very prominent part and often masks the true nature of the disease. Hence the proportion of unrecognized cancers is

¹ Delivered October 9, 1928.

higher in the aged than at other age periods. Owing to the very high incidence of cancer in the aged, the suspicion of this disease should be kept prominently in mind by diagnosticians. For the same reasons, special precautions against the outbreak of cancer may well be employed in the very aged. The detailed study of the action of factors essential to senescence in the origin of cancer in the aged is at present quite inadequate to determine the real influence of old age on the incidence of cancer.

X-RAY AND RADIUM IN THE PROBLEM OF OLD AGE¹

(ABSTRACT)

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The general statement is frequently made in the textbooks and the current literature of radio-therapy that tumors in the old are more susceptible to radiation than in the young. To test this I examined all the records of my clinic at St. Luke's Hospital of those above the age of sixty and found a considerable number of exceptions to this quite general statement. For instance, the bone sarcomata of the osteogenic type are highly resistant both in old and young. On the other hand, the giant cell tumors of the bone, which occur mostly in young people, are susceptible, while the few cases in the old are equally, though not more so. A case of the so-called endothelioma of the bone in a man of sixty-six was highly resistant to radiation, in contrast to the statements made that this tumor is very sensitive in the young.

In some of the diseases frequent in old age, radiation therapy is not as favorable as in younger people. One of these is herpes zoster, in which the pain as a rule is not as quickly checked as with the young. Pruritus of the aged is an extremely satisfactory condition to treat, as the results are often very good. It seems fully as sensitive, if

¹ Delivered October 9, 1928.

frequently remedy the condition. Deviations from normal blood pressure should be primarily regarded as symptoms that the heart is not functioning normally and adequately and such remedial treatment as is possible should be resorted to.

ANGINA PECTORIS ¹

(ABSTRACT)

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Nothing can appear more obvious to the ordinary students of the subject of angina pectoris than that the most frequently associated factor in causing the disease is emotional stress. No other one immediate factor is so dominant in the precipitation of the immediate paroxysm, and the very tendency of the disease to manifest itself chiefly in certain occupations and types of individuals is further illustrative of this fact.

The spiritual side of the case must not be neglected in this disease, in which emotions play so important a role. The development of the philosophy of life of the power of adaptation of desire to possibilities, the cultivation of suitable hobbies of a restful character such as reading, music and such pacific occupations as painting, etching, carving and similar pursuits, are of real medical benefit. Habits of restfulness and relaxation are to be cultivated. Climate is often very important and those who live in the temperate zones may well spend their winters in the south or perhaps go to live permanently in some mild temperate and congenial climate. Few patients do well in the cold places or at high altitudes. Each case must be made an individual problem. Sleep and rest are of crucial importance. Alcohol has a very definite benefit in very many cases, especially among the aged and arteriosclerotic.

If we sufficiently individualize treatment, we are much more likely to give relief as well as a prolonged and not

¹ Delivered October 11, 1928.

inconsiderable period of worth-while life and efficiency. Most of us can now cite unmistakeable instances in which complete relief, even cure, if you like, have been effected.

I think that all of us will admit that the condition is now much more frequent than was the case in the not remote past. Twenty or thirty years ago the disease was relatively rare in the so-called hospital classes. I have an explanation to offer for this fact, none other than that we are now certainly much more generally competent in the diagnostics and recognition of the complex. A few years back, it was considered almost as a disease of the intelligent aristocracy, and as particularly of great frequency among our own and other professions, a disease of the 'intelligentsia' if I may so say it. This distinction, in my observation, no longer pertains. I am finding angina frequent in my wards at the City Hospital, which is a charity hospital and one which caters I may say exclusively to the most unfortunate classes of our people. In my analysis of these cases at the hospital I have found almost without exception the disease associated with worry and great stress of life. These features are no longer confined to the so-called brain worker. All classes of society are now living lives of great and increasing emotional stress. The obligatory demand presented to every person, physical or brain worker, is for more speed, greater production and greater stress in every relation.

The statistical data which I have utilized in the preparation of this paper have been taken exclusively from my private consulting practice. Of the series of 320 cases studied, 62 persons, including most of the women, were engaged in domestic occupations. But 18 were physical laborers, including policemen, soldiers, firemen and the like; 26 cases were of the learned professions, 15 were engaged in artistic callings, 8 were financiers, 3 engineers. 50 patients occupied executive positions, and 79 were engaged in business ventures. This list suggests, of course, an increased occurrence among executives and business

men. As in all lists of this kind, the decisive ratios are largely influenced by the preponderating character of the clientele which comes to any particular physician.

It is my impression that the complex is of growing occurrence among women, due perhaps, to the increased stress of life to which they are obligated by the modern vocations of women, but my data still show a very high preponderance of men; notwithstanding the fact that my practice is about equally divided between men and women, 244 men are recorded in my data as compared to but 76 women.

In but four cases of true angina under my observation has tobacco been a possible causative factor; it is a common productive factor in toxic angina. This relation is becoming more and more important since women have so widely taken up the use of tobacco, for as a class I think we may definitely say that women are far more susceptible to the bad effects of tobacco than men. They are also for various reasons much more likely to carry the use of the weed beyond, far beyond, the mere employment designed to give pleasure and a feeling of content to the formation of a definite injurious habit. I am prepared, however, to admit with very few qualifications that the use of tobacco is undesirable in true angina pectoris, that it tends to augment the severity of bonafide attacks, to increase their frequency and greatly to increase the danger of the attacks. I know, however, of no authoritative study which has shown that tobacco can produce any changes in the heart muscle, in the coronary arteries or in the aorta which are capable of causing a true angina. I have never seen a case of supposed tobacco angina die, except that there were found after death lesions quite typical of those which cause angina pectoris and which can not be produced by tobacco alone. I have seen many instances of tobacco angina which were very distressing. I have seen patients so sensitized to the effects of tobacco that they might not enter a room in which smoking was going on without developing an attack, a clinical picture which is almost the

exact counterpart of a true anginal attack, but I have never seen such a case die. Almost without exception, prompt giving up of the drug in persons who have developed tobacco angina is followed almost, if not quite immediately, by a cessation of the attacks. I have seen no treatment in true angina which is so successful.

Coffee angina is much more frequent in advertising literature than in medical reports.

I have never seen a case of angina caused by the abuse of tea. I believe, nonetheless, that they do occur, but probably in very small numbers, save in populations which consume tea in greater abundance than is customary in the localities in which I have practiced. English and Canadian colleagues have described cases to me.

In all the toxic anginas almost immediate relief follows the elimination of the causative drug. Insofar as I can determine in none of the cases are any permanent lesions developed and the only treatment necessary is abstention from the drug.

Nearly every practitioner of years of experience has found families on his list who show a very definite family tendency toward the complex. It has been the most frequent manner of exitus in my own family for three generations, at least.

SENESCENCE AND REJUVENESCENCE FROM A BIOLOGICAL STANDPOINT¹

(ABSTRACT)

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In the simpler multicellular organisms senescence becomes evident as a decrease in respiratory metabolism and rate of growth. It may lead to death, but in many forms it leads to some process of asexual reproduction with re-

¹ The Harvey Lecture. Delivered October 11, 1923.

juvenescence, and death does not occur. In general in such organisms rejuvenescence occurs in the reorganization accompanying the formation of new individuals by budding, fission, etc. from parts of the original body, or by extreme starvation. In consequence of such rejuvenescence such organisms have no definite length of life and their physiological age cannot be measured in terms of time.

In the higher animals and man senescence shows the same general characteristics as in the simpler organisms, but the capacity of the body cells for rejuvenescence is narrowly limited under any known conditions. Changes which appear to constitute a slight degree of rejuvenescence can probably be brought about in various ways in man and the higher animals, but they are at best very slight.

Senescence is not a phenomenon of later life, but is going on from early developmental stages. In fact the organism is growing old most rapidly when it is youngest. Senescence apparently consists in accumulation of more or less inert products of metabolism and in progressive changes in protoplasms which make them less capable of maintaining metabolism and growth. Life, so to speak, clogs its own machinery. When conditions are so altered that previously accumulated inert substances are decomposed and removed and the protoplasmic changes of senescence are reversed, rejuvenescence occurs.

Various other periodic or cyclic phenomena in organisms appear to be fundamentally similar to senescence and rejuvenescence of the individual. The egg and the sperm, for example, are apparently highly differentiated, physiologically old cells nearing death from old age. Fertilization, however, initiates a process of rejuvenescence. In the early stages of embryonic development the organism is growing young, as various lines of physiological investigation have shown, and it is youngest, not at the beginning of development, but at a later embryonic stage.

There is some evidence that even in the unicellular organisms and in the cells of multicellular forms there may be some slight senescence in the period between successive divisions and that this is more or less completely compensated in the processes of division. The cycle of activity of various gland cells such as the pancreas cell resembles in certain respects an age cycle. The period of loading of the cell is a period of accumulation of substance and decreasing metabolism, the period of discharge, a period of dedifferentiation and increasing metabolism.

Senescence and rejuvenescence are biological terms which designate certain aspects of the equilibration process which constitutes life. They undoubtedly include a wide range of physicochemical changes which differ in character in different organisms. What these changes are we shall learn only as we learn what protoplasms and life are.

LIVER AND BILIARY PASSAGES¹

(ABSTRACT)

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Although the liver is the largest organ in the body, and has probably a greater amount of duties than any other organ, still it is remarkably free from changes which are the direct result of age; no important organ is more so. This is due largely to the peculiar blood supply of the liver and the practical absence of arterial degeneration. We hear a lot about senile degeneration of the heart muscle and of the arteries and of senile changes in the kidneys and the brain, but we do not hear much about the senile liver. Any changes in function produced are very much less clear and definite.

Even in the digestive tract there is a marked contrast between the liver and other organs. We know what old-

¹ Delivered October 12, 1928.

sistence of the liver to toxins by the use of glucose in making the treatment of syphilis of the liver more safe and in the treatment of ascites.

Early recognition and treatment of the toxemias of pregnancy and of focal infections which may produce local necroses in the liver are really important preservative measures.

In syphilis of the liver it is wise to give mercury and potassium iodide by mouth cautiously for several months so that fibrosis will be gradual and time allowed for collateral circulation to form. Early arsenic often does more harm than good.

In the treatment of ascites the new mercurial merbephen is quite successful in about a half of the cases, combined with ammonium chloride and Keith's dry diet. The toxemias of cirrhosis are little understood and the treatment is unsatisfactory. Glucose may give temporary relief.

Medical treatment of diseases of the gall bladder have lagged behind diagnosis. There is still a wide space between the ideal and actual medical treatment, but our present knowledge of the physiology of the gall bladder gives us a better guide to the value of any treatment proposed.

Our best cholagogue, bile salts, has little effect in emptying the gall bladder. The best diet for emptying the gall bladder, rich in fats, is difficult to combine with weight reduction which is so often needed. Lyon's biliary drainage has given a great impetus to the study of the gall bladder, but seems somewhat illogical with our present knowledge of the emptying of the gall bladder. McClure's work suggests that biliary drainage affects the liver (hepatitis) more than the gall bladder and that clinical improvement is due to restored liver function.

McMaster has shown that the output of cholesterol and its concentration in the bile is greatly increased by a rich diet and that the cholesterol is reduced at once by partly

excluding fats and lipoids from the diet. We hope that added knowledge of cholesterol metabolism will gradually lead to a better control of the formation of gall stones.

Surgery still holds the leading place in treatment of gall stones which cause symptoms.

DIGESTIVE PROBLEMS¹

(ABSTRACT)

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In our diagnosis, our therapy, our prognosis, we must consider the age of the patient. With our finer methods of diagnosis, more increased skill in the use of diet and physical methods, and better surgical procedure, there is an ever increasing number of cures in the case of patients in the 60s and 70s, where 10 or 20 years ago little would have been done to cure, and only halfhearted attempts made to make them more comfortable.

A considerable portion of the happiness of the old is dependent upon the condition of their digestive apparatus. Age has its compensations for the interests of the soul, even the activities of the mind may be enhanced by broader vision and the philosophic calm of increasing years. But they become as dust and ashes if the tongue be coated and the stomach awry.

Cancer is and always will be the subject of supreme interest to physicians and laity. Its consideration is of peculiar importance in this discussion because while met with in early life, it is peculiarly a disease of later life and old age.

Cancer seems to be on the increase, but how much of this is due to better methods of diagnosis and ever-increasing interest in the disease; how much to the steady increase of the average age of man with *ipso facto* the increasing in-

¹ Delivered October 12, 1928

alchemy and claimed to have discovered the Philosophers' Stone and the Elixir of Youth, in spite of which he died poor at the early age of 48.

8. Roger Bacon's treatise on the "Cure of Old Age", giving a cryptic formula for an Elixir of Youth.
In: Sinclair, St. John. *The Code of Health and Longevity*. Edinburgh, Constable, 1807, iv, 12-13.
9. Bacon, Roger. *Medulla Alchimiae* ... Eissleben, Jacobus Gaubisch, 1608.

Treatises on the Stone of the Wise and the various transmuting tinctures.

10. Formula for an oil which "mayntaineth the person long youthful".
In: Gesner, Conrad. *The Newe Jewel of Health* ... Faithfully corrected and published in Englishe by George Baker, Chirurgical. London, Denham, 1576, pp. 158-159.
(From the Dr. E. C. Streeter collection in the Academy)

11. The chapter "Of Retarding the Accidents of Old Age and Prolongation of Life".
In: Bacon, Roger. *Discovery of the Miracles of Art, Nature and Magic*. London. Miller, 1659, pp. 28-35.

12. Passages demonstrating popular beliefs in regard to the efficacy of the youth-giving Elixir.
In: Jonson, Ben. *The Alchemist*. London. Snodham. 1612, Act 2, Scene 1, Sig. D1.
(Lent by Dr. E. J. Rhodebeck)

13. Alexis Pedemontanus. *De' Secreti del Reverendo Donno Alessio Piemontese* ... Turino, Bevilacqua, 1580.
This is a treatise on the government of health and the retardation of age.

14. Chapter dealing with the determination of individual longevity by means of bodily measurements.
In: *An English Translation of the Sushruta Samhita* ... edited and published by Kariraj Lal Bhishagratna. Calcutta, 1907, i, 308-328.

EARLIER BOOKS ON OLD AGE

15. Arnoldus de Villa Nova. *The Conservation of Youth and Defense of Age* ... Translated by Dr. Jonas Drummond ... edited by Charles L. Dana. Woodstock, Vt., The Elm Tree Press, 1912.
This is a facsimile reprint of the early English translation of 1514.
16. The book "De conservanda juventute et retardanda senectute".
In: Arnoldus de Villa Nova. *Opera omnia*. Basiliae, Conrad Waldkirch, 1585.
(From the Dr. E. C. Streeter collection in the Academy)

OLD AGE EXHIBIT

17. Cicero, Marcus Tullius. *Cato Major, or the Old Man*. Philadelphia. B. Franklin. 1744.

This is the first edition of the English translation of Philadelphia.

(Kindly lent by the President, Dr. Samuel Johnson.)

18. Cornaro, Luigi. *Sure Methods of Attaining a Long Life ...* Translated into English by W. D. Johnson. 1768.

Luigi Cornaro (1461-1566), after a life of dissipation at the age of forty, then changed his life and became a monk. He disappeared and he attained a successful life till his death at the age of 102. He attained a long and healthy life and is one of the longest periods in his later life and is one of the longest.

19. Cornaro, Luigi. *The Art of Living Long*. 1768.

20. Cornaro, Luigi. *Means of Obtaining a Long Life*. 1768. which is added, *The Way to Wealth*, by B. Franklin. Johnson, 1809.

21. The third discourse, written at the age of 91. In: Cornaro, Luigi. *The Art of Living Long*. 1903, p. 91.

22. Cornaro, Luigi. *L'Art de vivre longtemps*. Paris, Roulet, 1768. de l'Ecole de Salerne ...

23. *Regimen Sanitatis Salerni ...* Translated into English by Thomas Paynel ... London, 1768.

This is one of the earliest and best of living. It is the product of the medical medicine, that of Salerno, and was written for 150 years.

(From the Dr. E. C. Streeter's collection.)

24. Paragraph dealing with the regulation of life. In: Elyot, Thomas. *The Castel of Education*. 1541, p. 41.

Thomas Elyot (1490?-1546), was an English author. He was chiefly interested in the theory of education. This is the first (1534) of which no copy has been dedicated to Cromwell.

(From the Dr. E. C. Streeter's collection.)

25. Ficinus Florentinus, Marsilius. *De Vita Longa*. The contents are three books on "De vita longa", and "De vita coelitus comparanda" at Basle not later than 1499.

26. Ficinus Florentinus, Marsilius. *De Vita Longa*. heit. [Strassburg, 1505].

This is an early German work on the preservation of health and the prolongation of life.

BOOKS FROM 1503 TO 1800

27. Rangoni, Tommaso. *De Vita Hominis ultra CXX annos protrahenda*. Venetiis, 1553.

Thomas Philologus Ravenna was the pseudonym used by Tommaso Rangoni.

28. Maynwaringe, Everard. *Vita Sana et Longa. The Preservation of Health and Prolongation of Life* ... London, J. D., 1670.

Maynwaringe was regarded as an empiric by his contemporaries.

29. Venner, Tobias. *Via Recta ad Vitam Longam* ... London, Fleshe, 1650.

This is the first edition of the treatise of a means for "attaining to a long and healthful life".

30. The use of Usquebath (whiskey) for sustaining the aged. In: Venner, Tobias. *Via Recta ad Vitam Longam*. 4. ed. London, Roper, 1660, p. 66.

(Kindly lent by the President, Dr. Samuel W. Lambert)

31. Floyer, Sir John. *The Art of Preserving Old Men's Healths* ... 2. ed. London, J. Torbuck, 1738.

Sir John Floyer was one of the most original physicians of the period in which he lived. He was the first to make regular observations upon the rate of the pulse, counting the number of beats in a minute by the watch.

32. Floyer, Sir John. *Medicina Gerocomica: or, The Galenic Art of Preserving Old Men's Healths* ... London, Isted, 1724.

It was Floyer who advised that young Samuel Johnson be sent up to be touched by Queen Anne for the "King's evil".

33. Card inscribed: The famous George Cheyne, a man of enormous bulk, reduced himself by dieting from 448 pounds to proper dimensions. One of his aphorisms says: "Every wise man after fifty ought to begin to lessen at least the quantity of his aliment, and if he would continue free from great and dangerous distempers and preserve his senses and faculties clear to the last, he ought every seven years to go on abating gradually and sensibly and at last descend out of life as he ascended into it, even into a child's diet."

From: Osler, William. *The Principles and Practice of Medicine*. 10. ed. New York, Appleton, 1925, p. 446.

31. Cheyne, George. *An Essay of Health and Long Life*. 6. ed. London, George Strahan, 1725.

George Cheyne (1671-1743) studied under Archibald Pitcairn. He was an ardent vegetarian and stated that God allowed the use of animal food to man only to shorten his life through the consequent multiplication of diseases and suffering.

35. Comparison between a sober and an intemperate life.
In: [Cheyne, George.] *Medicina Flagellata: or, The Doctor Scarify'd*. London, J. Bateman, 1721, p. 150.
This book is attributed to Cheyne, but cannot be said with certainty to have been written by him.
(From the Dr. E. C. Streeter collection in the Academy)
36. [Cohansen, Joannes Henricus.] *Hermippus Rediricus: or, The Sage's Triumph over Old Age and the Grave ...* 2. ed. London, J. Nourse, 1749.
37. Hufeland, Christoph Wilhelm. *Die Kunst das menschliche Leben zu verlängern*. Jena, 1798.
38. Easton, James. *Health and Longevity*. New and improved ed. Salisbury, The Compiler, 1823.
39. Easton, James. *Human Longevity: recording the name, age, place of residence, and year of the decease of 1712 persons who attained a century and upwards ...* Salisbury, James Easton, 1799.

BOOKS FROM 1800 TO 1855

40. Seiler, Burcardo Guilielmo. *Anatomiae corporis humani senilis specimen*. Erlangae, Jo. Jac. Palm, 1800.
This book was written when Seiler was 20 years old and in the year of his graduation from Erlangen University.
41. John Rorin in the 172nd and Sarah, his wife, in the 161th year of their respective ages.
Frontispiece of: Sinclair, Sir John. *The Code of Health and Longevity ...* Edinburgh, Constable, 1807, vol. i.
Sir John Sinclair (1754-1835), the first president of the Board of Agriculture, devoted much of his time in his later years to the composition of what he called the Codean System of Literature, in which all knowledge was to be summarized in four departments, comprising agriculture, health, political economy and religion. The code of health was published in four volumes in 1807, and the code of agriculture in 1817. The other two were never completed though materials were collected and the plan drawn up. Sir John's excursion into medicine brought upon him considerable ridicule. It was, as he himself says, "undertaken in opposition to the opinions of some most respectable friends".
42. Petratsch Zortan in the 185th year of his age.
Frontispiece of: Sinclair, Sir John. *The Code of Health and Longevity ...* Edinburgh, Constable, 1807, vol. ii.
43. Johnson, James. *The Economy of Health ...* New York, Harper, 1837.
James Johnson (1777-1845) was a naval surgeon and a man of much ability and industry.

44. Carlisle, Anthony. *An Essay on the Disorders of Old Age* ... 2. ed. London, Longman, 1818.
Sir Anthony Carlisle (1768-1840) introduced the thin bladed, straight edged amputating knife in place of the old clumsy crooked one.
45. Carlisle, Anthony. *The Means of Preserving Health and Prolonging Life* ... London, Churchill, 1841.
46. Bell, John. *On Regimen and Longevity* ... Philadelphia, Haswell & Johnson, 1842.
John Bell (1763-1820) was a lecturer on anatomy and surgery at the Royal College of Surgeons, Edinburgh, where he was the leading operating surgeon for twenty years.
47. Day, George Edward. *A Practical Treatise on the Domestic Management and Most Important Diseases of Advanced Life*. London, Boone, 1849.
George Edward Day (1815-1872) was an industrious contributor to medical periodical literature and to the publications of many learned societies.
48. Bostwick, Homer. *An Inquiry into the Cause of Natural Death or Death from Old Age*. New York, Stringer and Townsend, 1851.
49. Durand-Fardel, Charles Louis Maxime. *Traité Clinique et Pratique des Maladies des Vieillards*. Paris, Baillière, 1854.
Charles Louis Maxime Durand-Fardel (1815-1899) was particularly noted for his work on mineral waters and especially those of Vichy. It was undoubtedly here that he acquired his interest in chronic disease and the diseases of old age.
50. Durand-Fardel, Charles Louis Maxime. *Handbuch der Krankheiten des Greisenalters*. Würzburg, Stahel, 1858.

BOOKS FROM 1855 TO 1878

51. Flourens, Marie Jean Pierre. *On Human Longevity* ... Translated from the French. 2. ed. ed. by Charles Martel. London, Baillière, 1855.
Marie Jean Pierre Flourens (1794-1869) was professor of anatomy at the University of Paris. His famous axiom was that since it takes a man twenty years to grow he should live five times that, or one hundred years.
52. Charcot, Jean Martin. *Leçons Cliniques sur les Maladies des Vieillards* ... Paris, Delahaye, 1867.
Jean Martin Charcot (1825-1893) was born in Paris where he became during his active years the outstanding medical figure in France. He was chief physician to the Hospice Salpêtrière and it was here during the years 1866-1878 that he studied and wrote of chronic diseases, diseases of old age, and diseases of the nervous system. It is on this last work that his fame rests.

53. Charcot, Jean Martin. *Leçons sur les Maladies des Vieillards*. Paris, Delahaye, 1868.
54. Charcot, Jean Martin. *Clinical Lectures on the Diseases of Old Age*. Translated by Leigh H. Hunt. New York, Wood, 1881.
55. Charcot, Jean Martin. *Clinical Lectures on Senile and Chronic Diseases*. Translated by William S. Tuke. London, New Sydenham Society, 1881.
56. Lambert, T. S. *Longevity*. Part I. Biometry (The Measure or Span of Life). New York, Wood, 1869.
57. Noirot, L. *L'Art de Vivre Longtemps*. 6. ed. Paris, Dentu, 1869.
58. Lalor, Robert D. *The Origin of Life and the Causes of Death ...* 5. ed. London, Bay House, 1874.
59. Gardner, John. *Longevity: The Means of Prolonging Life after Middle Age*. London, King, 1874.
60. Hall, William W. *How to Live Long ...* New York, Hurd and Houghton, 1875.

William Whitty Hall (1810-1876) came to New York in 1851, and in 1854 established "Hall's Journal of Health", a periodical which he ably conducted for many years.

BOOKS FROM 1879 TO 1908

61. Evans, Chas. W. DeLacy. *Can we Prolong Life? ...* London, Baillière, 1879.
62. Bailey, John Burn. *Modern Methuselahs ...* London, Chapman and Hall, 1888.
63. Young, T. E. *On Centenarians; and the Duration of the Human Race*. London, Layton, 1899.
64. Crichton-Browne, Sir James. *The Prevention of Senility and a Sanitary Outlook*. London, Macmillan, 1905.
65. Hufeland, Christopher William. *The Art of Prolonging Life*. Edited by Erasmus Wilson. Philadelphia, Lindsay & Blakiston, 1880.
66. Page showing the formula for Brown-Séguard's Elixir of Life.

In his: *The Elixir of Life ... edited by Dunbar Newell*. Boston, Cupples, 1889, pp. 24-25.

Charles Edouard Brown-Séguard (1817-1894) a noted physiologist, was educated in Paris under Trousseau and immediately devoted himself to the most recondite parts of physiology. His studies on the spinal cord tracts were of most importance, and he shares with Claude Bernard the honor of demonstrating the existence of vasomotor nerves. The Elixir of Life was formulated in later years and bore the crude germ of gland transplantation. Brown-Séguard died in Paris in April, 1894.
67. de Plasse, L. *La Longévité ou l'Art de Prolonger la Vie*. New York, Weiss, 1902.

68. Dorland, W. A. Newman. *The Age of Mental Virility ...* New York, Century, 1908.
69. Humphry, George Murray. *Old Age and Changes Incidental to It. The annual oration delivered before the Medical Society of London, May 4th, 1883.* Cambridge, Macmillan and Bowes, 1885.
70. André, G. *L'Hygiène des Vieillards.* Paris, Doin, 1890.
71. Card inscribed: "Mix merry laughter with earnest labor. Always have some as yet unfinished but not too urgent job waiting just outside your door. Then you will never know ennui. To 'kill time' is murder in the first degree." W. W. Keen's receipt for longevity in his address at the dinner celebrating his 81th birthday (1921). In: Keen, W. W. *The Surgical Operations on President Clereland in 1893 ...* Philadelphia, 1928, p. 230.
- William W. Keen of Philadelphia, the doyen of the American medical profession, is an honorary Fellow of the Academy.
72. Walsh, David. *Age and Old Age ...* London, Everett, 1902.
73. Minot, Charles S. *The Problem of Age, Growth, and Death.* New York, Putnam, 1908.

Charles Sedgwick Minot (1852-1914) was James Stillman professor of comparative anatomy and director of anatomical laboratories at Harvard Medical College from 1905 to his death. He was trained as a physiologist under Ludwig at Leipzig, carrying out several physiological researches on muscle, growth, etc. He has devised two forms of automatic microtomes.

BOOKS FROM 1908 TO 1914

74. Chapter on microbes as the cause of senility. In: Metchnikoff, Elie. *The Prolongation of Life ... English translation; edited by P. Chalmers Mitchell.* New York, Putnam, 1908, pp. 73-83.
- Elie Metchnikoff (1845-1916) was born in Russia. He studied and lived most of his life there and gained considerable renown as a biologist especially because of his researches on the embryological origin of the intestine and on the problem of intracellular digestion. He went to the Pasteur Institute in Paris in 1887 and it was here that he instituted his studies on the lactic bacilli and the conquest of intestinal putrefaction. His famous aphorism on the relationship of age to one's gastronomic régime is "nous vieillissons par le ventre".
75. Metchnikoff, Elie and Williams, Henry Smith. *Why Not Live Forever? Cosmopolitan Magazine*, 1912, pp. 436-446.
76. Roeser, P. H. *Vielliesse et Longévité.* Paris, Maloine, 1910.
77. Mühlmann, M. *Das Altern und der physiologische Tod ... In: Sammlung anatomischer und physiologischer Vorträge und Aufsätze.* Heft 11, Jena, Fischer, 1910.

78. Henley, B. J. *The Art of Longevity* ... Syracuse, N. Y., 1911.
79. Weber, Sir Hermann. *On Means for the Prolongation of Life* ... 3. ed. enl. London, Bale, 1908.
80. Pic, Adrien. *Précis des Maladies des Vieillards* ... Avec la collaboration de S. Bonnamour. Paris, Doin, 1912.
81. Lorand, Arnold. *La Vieillesse* ... Paris, Baillière, 1911.
Arnold Lorand is medical consultant at Carlsbad.
82. Scott, Thomas Bodley. *The Endocrines in the Treatment of Premature Old Age*.
Reprinted from: *New York Medical Journal*, 115:431-433, 1922.
83. Scott, Thomas Bodley. *The Road to a Healthy Old Age* ... New York, Hoeber, 1914.
84. Scott, Thomas Bodley. *The Road to a Healthy Old Age*. London, Unwin, 1917.
85. Thompson, William Gilman. *Centenarians and Nonagenarians*.
Reprinted from: *Medical Record*, 83:277-280, 1913.
William Gilman Thompson (1856-1927) was professor of medicine at Cornell University Medical College 1898-1916. He devoted much time and thought to the constitution, management and educational value of hospitals. He was a trustee of the Academy, 1909-1924. His contributions to literature covered a wide range of clinical subjects. He died in New York City, October, 1927.
86. Nascher, Ignatz Leo. *Geriatrics* ... Philadelphia, Blakiston, 1914.
87. Nascher, Ignatz Leo. *A Plea for the Study of Geriatrics*.
Reprinted from: *Medical Record*, 78: 536-538, 1910.
88. Nascher, Ignatz Leo. *The Neglect of the Aged*.
Reprinted from: *Medical Record*, 86: 457-460, 1911.
89. Nascher, Ignatz Leo. *Some Geriatric Aphorisms*.
Reprinted from: *American Medicine*, n.s. 9: 723-726, 1911.

BOOKS FROM 1914 TO PRESENT DAY

90. Bell, Alexander Graham. *The Duration of Life and Conditions Associated with Longevity*. Washington, Genealogical Record Office, 1918.
Alexander Graham Bell (1847-1922), inventor of the telephone and photophone, was apparently much interested in the problems of old age, for he wrote several articles upon them.
91. Voronoff, Serge. *Vivre. Etude des Moyens de Reléver L'Energie Vitale* ... Paris, Bernard Grasset, 1920.
On the 8th of October, 1919, before the 28th French Congress of Surgery, Voronoff announced his rejuvenation experiments by gland transplantation. There was much enthusiasm and his notoriety at once became worldwide. He is now Director of the Laboratory of Biology of Ecole des Hautes Etudes in Paris.

92. Voronoff, Serge. *The Conquest of Life. Translated by G. Gibier Rambaud.* New York, Brentano, 1928.
93. Voronoff, Serge. *The Study of Old Age and My Method of Rejuvenation. Translated by Fred. F. Imianitoff.* London, Gill Publishing Co., 1926.
94. Thewlis, Malford W. *Geriatrics ...* St. Louis, Mosby, 1919.
95. Thewlis, Malford W. *Geriatrics as a Special Branch of Medicine.* Reprinted from: *Medical Journal and Record*, 119:304-305, 1924.
96. Pryke, Sir William, Orpen, Sir William, O'Connor, T. P., and others. *How to Live Long.* London, Hutchinson, [1926].
97. Lacassagne, Alexandre. *A Green Old Age. Translated by Herbert Wilson.* London, Bale, 1923.
98. Bardwell, Francis. *The Adventure of Old Age.* Boston, Houghton, 1926.
99. Pearl, Raymond. *Alcohol and Longevity.* New York, Knopf, 1926.
100. Goizet, Louis Henri. *Never Grow Old ...* New York, Putnam, 1920.
101. MacCabe, F. F. *Human Life and How it May be Prolonged to 120 Years.* London, Grant Richards, 1919.
102. Holmes, S. J. *Age at Parenthood, Order of Birth, and Parental Longevity in Relation to the Longevity of Offspring. University of California Publications in Zoology.* 31:359-375, 1928.
103. A special number devoted to age and disease. *Practitioner*, 115: 1-96, 1925.
104. Rolleston, Sir Humphry Davy. *Concerning Old Age.*
Read at: The Royal Institution of Great Britain, weekly meeting, Friday, May 13, 1927. *Nature* (London), 120: Supp. 2-12, 1927.
105. Rolleston, Sir Humphry Davy. *Some Medical Aspects of Old Age.* London, Macmillan, 1922.
Sir Humphry Rolleston (1862-), formerly President of the Royal College of Physicians, 1922-26, was made Regius Professor of Physic, University of Cambridge in 1925.

OLD AGE IN POETRY AND LAY PROSE

106. Card inscribed: Chinese Medical Sayings and Proverbs.
Taken from: *Reports of the North Manchurian Plague Prevention Service*, 5: 300-315, 1925-1926. Quotations, numbers 45, 144, 190, 208, 212, 230, 231, 270, 271, 272.
107. Cards Inscribed: Quotations from the Poets.
Taken from: Hoyt, J. K. *The Cyclopedia of Practical Quotations.* New York, Funk & Wagnalls, 1896, pp. 8-12.
Quotations are those dealing with old age from Beranger, Byron, O. W. Holmes, Longfellow, Milton, Shakespeare, Swift.
108. Card quoting verse from: *The Bible*, Psalm XC—verse 10.

109. Card quoting verses from: *The Bible*, Psalm CIII—verses 15 and 16.

110. *The Bible*. Ecclesiastes, Chap. XII.

This chapter is always mentioned in any discussion of the course of human life. It is also one of the cryptic chapters.

111. Mead, Richard. *Medica Sacra* ... London, Brindley, 1755, pp. 38-56

This chapter is a commentary on Ecclesiastes Chap. XII. Many others have puzzled over the meaning of verses 3 and 6.

112. The Old Man and Death.

In: *Fables of Aesop and Others* ... London, J. Tonson, 1722. Fable LXVI.

This is the so-called Croxall edition which was very popular during the 18th century.

(Lent by Dr. E. J. Rhodebeck)

113. "Of Old Age".

In: Petrarch (Petrarca) Francesco. *Phisicke Against Fortune* ... Englished by Thomas Twayne. London, Richard Walkyns, 1579, p. 262. 83rd Dialogue.

These dialogues were written by Petrarch, the greatest of the Italian sonnetteers, as bucklers against both fortune and adversity.

(Kindly given by Mrs. Walter B. James)

114. Passages dealing with longevity.

In: Torquemedá, Anthonio. *The Spanish Mandeville of Miracles* ... London, I. R., 1600, fol. 24.

This is a curious book of tales, legends and popular beliefs.

(Lent by Dr. E. J. Rhodebeck)

115. Character of "An Olde Man" described.

In: Overbury, Sir Thomas. *His Wife. With additions of new news and divers more characters* ... London, Edward Griffin, 1618, Sig. D4.

Sir Thomas Overbury was particularly known in his day for his poem, "A Wife" and for his delineations of various common characters. He became involved in a court intrigue and was poisoned while a prisoner in the Tower.

(Lent by Dr. E. J. Rhodebeck)

116. Essay "Of Youth and Age".

In: Bacon, Francis. *The Essays or Counsels Civill and Morall* ... London, John Beale, 1639, p. 247.

Francis Bacon (1561-1626), courtier, statesman and founder of experimental philosophy, is perhaps best known by his book of essays, of which this, on youth and age, is a good example.

(Lent by Dr. E. J. Rhodebeck)

117. Extracts concerning old age from the British dramatic poets before the year 1655.

In: Cotgrave, John. *The English Treasury of Wit and Language*

134. Reproduction of a Portrait of Katherine, Countess of Desmond, reputed to have lived to 140 years.
In: Rolleston, Sir Humphry Davy. *Some Medicinal Aspects of Old Age*. London, Macmillan, 1922.
135. Reproduction of a Portrait of Henry Jenkins, reputed to have lived to 169 years.
In: Rolleston, Sir Humphry Davy. *Some Medical Aspects of Old Age*. London, Macmillan, 1922.
136. Account of the post mortem examination of the body of Thomas Parr, which was made by William Harvey.
In: Harvey, William. *An Anatomical Disquisition on the Motion of the Heart and Blood in Animals*. London, Dent, [1906], pp. 207-211.
Harvey decided that Parr died of a suffocation due to the impure air of London after having lived all his life in the country.
137. Reproduction of a Portrait of Thomas Parr.
In: Rolleston, Sir Humphry Davy. *Some Medical Aspects of Old Age*. London, Macmillan, 1922.
Thomas Parr is reputed to have died at the age of 152 years.
138. Reproduction of a Portrait of Harry Morgan at the age of 105 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)
139. Reproduction of a Portrait of Donald McLeod at the age of 102 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)
140. Reproduction of a Portrait of Mother George at the age of 120 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)
Mother George, who lived to the age of 120 years, resided in the Parish of Saint Peter's in Bailly at Oxford. She retained the use of all her faculties and was much resorted to by company from motives of curiosity. She was wont to thread a fine needle as proof of the excellence of her eyesight. She died from the effect of a fall.
141. Reproduction of a Portrait of Peter Garden who died at the reputed age of 131 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)
142. Reproduction of a Portrait of Isobel Walker who died at the reputed age of 112 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)
143. Reproduction of a Portrait of Jane Scrimshaw at the reputed age of 126 years.
In: A Scrapbook of Remarkable Characters.
(Kindly lent by the Grolier Club)

144. Reproduction of a Portrait of Old Scaleits, sexton of Peterboro, at the age of 98 years.

In: A Scrapbook of Remarkable Characters.

(Kindly lent by the Grolier Club)

This has the curious legend as follows:

"You see old Scaleits picture stand on hie
But at your feet there doth his body lye.
His gravestone doth his age and death time show
His office by theis tokens you may know.
Second to none for strength and sturdiye limm
A scarbabe mighty voice with visage grim.
He had interd two queens within this place
And this towns householders in his lives space
Twice over: but at length his one turn came
What he for others did for him the same
Was done no doubt his soul doth live for aye
In Heaven: though here his body clad in clay

July 2, 1591 R.S. actatis 98".

145. Reproduction of a Portrait of Dr. Stephen Smith made for his 95th anniversary at the Battle Creek Sanitarium, 1918.

Bears autographed inscription.

Stephen Smith (1823-1922), pioneer public health officer, well known surgeon and member of The New York Academy of Medicine. He was professor of surgery and of anatomy at the Bellevue Medical School and professor of clinical surgery in the New York University Medical School. He was father of the Metropolitan Health Bill, created the American Public Health Association and initiated sundry reforms in hospital service and medical education. His writings were many and varied, the best known being "The City that Was" and his "Principles and Practice of Operative Surgery". He died August 26, 1922, just six months short of his hundredth birthday.

146. Reproduction of photographs of Stephen Smith at the ages of 25 and 95 years.

In: *Medical Life*, 35: 290, 1928.

147. Chapter dealing with unusual cases of longevity.

In: Gould, George M., and Pyle, Walter L. *Anomalies and Curiosities of Medicine* ... Philadelphia, Saunders, 1900, pp. 365-382.

148. Reproduction of a photograph of an example of progeria or premature old age.

In: Gilford, Hastings. On a Condition of Mixed Premature and Immature Development.

In: *Medico-Chirurgical Transactions* ... 80: 17-47, 1897, plate X

134 BULLETIN of the NEW YORK ACADEMY of MEDICINE

149. Depew, Chauncey M. No More Old Men.

In: *New York Times*, November 17, 1916.

Report of an address before The New York Academy of Medicine.

150. Report of a Chinese who was reported to have recently celebrated his 250th birthday.

In: *The Times*, weekly edition, London, August 23, 1928.

151. Card Inscribed: Thomas Alva Edison (1847-), foremost American inventor, is 81 years of age and is still actively engaged in research.

152. Photograph of Thomas Alva Edison at the age of three.
(Kindly lent by Thomas Alva Edison)

153. Photograph of Thomas Alva Edison at the age of thirty-one.
(Kindly lent by Thomas Alva Edison)

154. Photograph of Thomas Alva Edison at the age of thirty-five.
(Kindly lent by Thomas Alva Edison)

155. Photograph of Thomas Alva Edison at about fifty years of age.
(Kindly lent by Thomas Alva Edison)

156. Photograph of Thomas Alva Edison at the age of sixty-four, with a group of workers.
This group was facetiously known as "The Insomnia Squad", because it worked night and day for six weeks.
(Kindly lent by Thomas Alva Edison)

157. Photograph of Thomas Alva Edison at a banquet given in his honor on his seventieth birthday.
(Kindly lent by Thomas Alva Edison)

158. Photograph of Thomas Alva Edison at the age of eighty.
(Kindly lent by Thomas Alva Edison)

159. Familial Longevity. Mrs. Mary Maidment celebrated her 102nd birthday on October 11. She belongs to the third centenarian generation, her mother living to 104 and her maternal grandfather to 100.
In: *Lancet*, 2: 801, 1928.

RECENT ACCESSIONS TO THE LIBRARY

- Adler, A. Praxis und Theorie der Individualpsychologie...
3. Aufl., München, Bergmann, 1927, 257 p.
- de Beer, G. R. Vertebrate zoology.
London, Sidgwick, 1928, 503 p.
- Bing, R. Kompendium der topischen Gehirn-und Rückenmarksdiagnostik.
7. Aufl., Berlin, Urban, 1927, 259 p.
- Boeminghaus, H. Urologische Diagnostik und Therapie...
Jena, Fischer, 1927, 217 p.
- Brandt, R. & Szandiez, S. Die serologischen Reaktionen der Syphilis.
Berlin, Urban, 1928, 90 p.
- Brown, G. E. & Allen, E. V. Thrombo-angiitis obliterans.
Phil., Saunders, 1928, 219 p.
- Caven, R. M. & Cranston, J. A. Symbols and formulae in chemistry...
London, Blackie, 1928, 220 p.
- Cemach, A. J. Surgical diagnosis in tabular outline...
Phil., Davis, 1928, 82 pl. 84 tab.
- Chapin, H. D. & Royster, L. T. Diseases of infants and children.
6. ed., N. Y., Wood, 1928, 675 p.
- Chesser, E. S. Youth. A book for two generations...
N. Y., Dutton, [1928], 112 p.
- Darling, H. C. R. Surgical nursing and after-treatment.
3. ed., London, Churchill, 1928, 626 p.
- Emerson, C. P. Essentials of medicine.
8. ed., Phil., Lippincott, [1928], 588 p.
- European clinics... 1927.
Phil., Lippincott, 1928, 347 p.
- Faure, J. L. & Siredy, A. Traité de gynécologie médico-chirurgicale.
4. éd., Paris, Doin, 1928, 1319 p.
- Finger, C. J. David Livingstone, explorer and prophet.
London, Allen, [1927], 300 p.
- Garrè, C. & Borchard, A. Lehrbuch der Chirurgie.
6. Aufl., Leipzig, Vogel, 1928, 752 p.
- Gohrbrandt, E., Karger, P. & Bergmann, E. Chirurgische Krankheiten im Kindesalter.
Berlin, Karger, 1928, 916 p.
- Gibson, C. R. Modern conceptions of electricity.
London, Seeley, 1928, 283 p.
- Groves, E. R. The marriage crisis.
N. Y., Longmans, 1928, 242 p.
- Gruber, G. Die Welt der kleinsten Lebewesen.
Berlin, Ullstein, [1927], 180 p.
- Gruenberg, S. M. Your child, today and tomorrow.
3. ed., Phil., Lippincott, 1928, 255 p.
- Hanström, B. Vergleichende Anatomie des Nervensystems der wirbellosen Tiere...
Berlin, Springer, 1928, 628 p.

Volkskunde (Die) und ihre Beziehungen zu Recht, Medizin,
Vorgeschichte...

Berlin, Stubenrauch, 1928, 64 p.

Wall, O. A. Handbook of pharmacognosy.
5. ed., revised by L. Suppan.

St. Louis, Mosby, 1928, 472 p.

Ward, H. Charles Darwin. The man and his warfare.
London, Murray, [1927], 472 p.

Watson, J. B. & McDougall, W. The battle of behaviorism.
London, Paul, 1928, 103 p.

Williams-Ellis, A. How you began. A child's introduction to biology.
London, Howe, [1928], 95 p.

Wilson, S. A. K. Modern problems in neurology.
London, Arnold, 1928, 364 p.

Wlassak, R. Grundriss der Alkoholfrage.
2. Aufl., Leipzig, Hirzel, 1929, 255 p.

Wood-Allen, M. What a young woman ought to know.
New ed., Phil., Vir, [1928], 272 p.

Ziegner, H. Vademekum der speziellen Chirurgie und Orthopädie für
Aerzte.
9. Aufl., Leipzig, Vogel, 1928, 326 p.

PROCEEDINGS OF ACADEMY MEETINGS DECEMBER

STATED MEETINGS

Thursday Evening, December 6, at 8:30 o'clock

Program presented in cooperation with the Section of Dermatology and
Syphilis

ORDER

I. EXECUTIVE SESSION

Election of Officers

II. PAPERS OF THE EVENING

Allergy in Dermatology

- The skin as a shock tissue, Arthur F. Coca
- Clinical aspects of allergy in skin diseases, Sigmund Pollitzer;
discussion, Abraham Walzer, Charles Mallory Williams

Thursday Evening, December 13, at 8:30 o'clock

THE THIRD HARVEY LECTURE

Metallotherapy of the spirochaetoses, C. Levaditi, Professor of Microbiology,
Institut Pasteur, Paris; Peyton Rous, President, Harvey Society; Philip
D. McMaster, Secretary, Harvey Society.

This lecture takes the place of the second Stated Meeting of the Academy
for December

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, December 4, at 7:45 o'clock

ORDER

I. PRESENTATION OF PATIENTS

- a. Cases from the Vanderbilt Clinic, J. Gardner Hopkins, A. Benson Cannon, George C. Andrews, Lawrence K. McCafferty, Herman Feit, Paul Gross, Herman Sharlit, Lewis B. Robinson
- b. Miscellaneous Cases

II. DISCUSSION

III. EXECUTIVE SESSION

Attention is called to the Stated Meeting of the Academy on December 6. Examination of cases is limited to members and their invited guests. Kindly note change in hour.

SECTION OF SURGERY

Friday Evening, December 7, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Bilateral modified Pirogoff amputation, Joseph E. J. King
- b. Cases of fractures of clavicle illustrating paper of the evening, Charles W. Lester
- c. Cases of fractures of the neck of the femur illustrating paper of the evening, Paul Crenshaw Colonna

III. PAPERS OF THE EVENING

- a. Fractures of the clavicle with special reference to the treatment, Charles W. Lester
- b. Fracture of the neck of the femur in childhood, Paul Crenshaw Colonna

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, December 11, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PATHOLOGICAL PRESENTATION

- A case of pseudo-bulbar paralysis with unusual pathologic findings (lantern slides), Lewis D. Stevenson

III. PAPERS OF THE EVENING

- a. The convulsive state and the results obtained by limitation of fluids, Temple Fay, Philadelphia (by invitation); discussion, Charles A. Elsberg, Foster Kennedy, Israel Strauss
- b. Segmental hyperalgesia and segmental increased muscle tone in

disease of the lungs and heart, Jesse G. M. Bullova; discussion.
S. Philip Goodhart, Walter M. Kraus.

SECTION OF PEDIATRICS
Thursday Evening, December 13, at 8:30 o'clock

ORDER

- I. PAPER OF THE EVENING
The development diagnosis of behavior in infancy and its significance for clinical pediatrics. Stereopticon and motion pictures, Arnold Gesell, Director, Yale Psycho Clinic (by invitation); discussion, Sanger Brown, 2nd, Lawson G. Lowrey (by invitation), Helen Wooley, Ph.D. (by invitation).

SECTION OF OTOTOLOGY
Friday Evening, December 14, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
- III. PAPERS OF THE EVENING
 - a. Notes on the surgery of acute labyrinthitis, Ralph Almour
 - b. Early operative treatment of otitic meningitis, with case reports, Samuel J. Kopetzky; discussion, Wells P. Eagleton, E. D. Friedman

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY
ORDER

- I. READING OF THE MINUTES
- II. CLINICAL CASES
 - a. Circumcorneal papilloma, William B. Doherty
 - b. Intracranial cyst with double choked disc in child; operation and recovery, Raymond C. Dodd
 - c. (1) Monocular diplopia, bilateral, the result of chronic encephalitis
(2) Unusual corneal pigmentation (Fleischer's ring) in hepato-lenticular degeneration, Daniel L. Poe (by invitation)
- III. DEMONSTRATION
Ten microscopical slides of intraocular diseases, Melvin G. Herzfeld (by invitation)
- V. PAPERS OF THE EVENING
 - a. Radium therapy in diseases of the eye and adnexa, with presentation of patients, G. Allen Robinson
 - b. The new intracapsular operation, being gist of recent experience abroad with Col. Henry Smith and Prof. E. Kalt, Charles B. Meding
- V. EXECUTIVE SESSION

SECTION OF MEDICINE

Tuesday Evening, December 18, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. The circulatory response to hyperthyroidism and myxedema, Herman Blumgart, Harvard Medical School (by invitation)
- b. What are the objects of digitalis therapy? Harold J. Stewart (by invitation)
- c. A study of obesity, circulatory, x-ray and electrocardiograph investigations, Arthur M. Master

II. DISCUSSION, Alfred E. Cohn, Robert L. Levy

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, December 18, at 8:30 o'clock

Kindly note change in date

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. An unusual traumatic gynecological case, Emil Albin Rundquist (by invitation); discussion, George L. Brodhead, Harry Aranow
- b. A case of traumatic evisceration, Salvatore di Palma; discussion, David N. Barrows, Gerald L. Moench.
- b. A case of traumatic evisceration, Salvatore di Palma

III. PAPERS OF THE EVENING

- a. Vaginal examination in the third stage of labor as a guide to its management. A report of one thousand cases, Morris Leff (by invitation); discussion, Harry Aranow, George L. Brodhead, William Edgar Caldwell, William H. Carey (by invitation), Everett M. Hawks, Maurice O. Magid.
- b. The treatment of retro-displacements of the uterus, John Cooke Hirst (by invitation); discussion, Ralph A. Hurd, Henry C. Falk

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, December 19, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. A new needle holder, Abraham Ravich (by invitation)
- b. Epithelioma of penis—specimen, George A. Wyeth
- c. Unusual foreign body with vesical calculus, Clarence G. Bandler

III. PAPERS OF THE EVENING

- a. Etiology and pathology of vesico-renal reflux, Robert Gutierrez (by invitation); discussion, Oswald S. Lowsley

A donation or bequest of \$5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate.

DEATH NOTICE

WILLIAM PFEIFFER, M.D., 839 Prospect Place, Brooklyn, New York; graduated in medicine from Cornell University Medical College, New York City, in 1903; elected a Fellow of the Academy May 4, 1922. He was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the American Association of Obstetricians and Gynecologists, and Abdominal Surgeons, a member of the Pathological Society, a member of the Gynecological Society, a member of the New York Obstetrical Society, Obstetrician and Gynecologist to Kings County and Holy Family Hospitals. Obstetrician-in-Chief to Beth Moses Hospital and Obstetrician to Peck Memorial Hospital. Dr. Pfeiffer died December 8, 1928.

INDEX

The index for the year 1928 is in press and will be mailed in the near future.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V.

FEBRUARY, 1929

No. 2

EDITORIAL

THE EVIL SPOKEN OF PHYSICIANS AND THE ANSWER THERETO

In the initial volume of the Proceedings of the Charaka Club, Dr. Dana has already handled the negative aspect of this theme.¹ He has not only isolated the hardest and meanest sayings against our profession, but has classified them with reference to their stereotypy and their relative futility. He began (he says) to collect such things in a scrap-book, then finding that their monotonous sameness rather bored and discouraged him, he finally discovered that the thing had already been done in the 17th century by Bernier and latterly in three volumes by Witkowski, entitled *Le mal qu'on a dit des médecins*. Dana notes that the multifarious indictments of medicine in the past fall easily into sets of trite monotonous or categories. These rusty weapons and damp ammunition, formerly employed so continuously to belittle our profession, ran, as a rule, to some such types as the following:

1. The doctor usually kills rather than cures.
2. Nature, left to herself, will usually heal the patient, but drugging may harm or kill him.
3. The doctor is a pompous, pedantic, ceremonious duffer, who talks learnedly out of books to conceal his ignorance of reality.
4. In medical consultations, the patient is slain by the *force majeure* of numbers.
5. The demands of professional ethics and etiquette were formerly such, that it was deemed better for a patient to die by rule (*secundum*

¹ C. L. Dana: *Tr. Charaka Club*, N. Y., 1902, I, 77-90. The object of this editorial is to supplement the contributions of Witkowski, Dana and others by some other findings, collected over a number of years.

artem) than to recover in defiance of medical principles. This affectation of legality or pontifical infallibility is, and has been, the weak link (in the eyes of enemies, the crooked element) in medical practice. It is here naturally that the quack finds his opportunity and gets his innings.

6. The doctor trades upon illness, gets rich through the prevalence of disease, whenever it does not affect himself or impoverish his clientèle. He is one of the few professional people who is not punishable for murder. He is, in fact, hand in glove with the undertaker.
7. He pours medicines, of which he knows little, into bodies of which he knows less.

For over twenty-five centuries, at least, these stereotyped slurs were cast up against physicians without let or hindrance. Why? Dr. Dana answers this question elsewhere, as follows: "Of all sciences, the medical have been the slowest in growth . . . In the history of medicine, there is no more notable feature than this prolonged absence of all real progress."² Before 1850, in fact, the history of medicine is a somewhat gloomy recital of ups and downs, like Carlyle's account of walking, in which progression is made as much by falling as by rising. In each period, there was the same illusion of progress, but, in retrospect, the sombre truth in Lecky's lines seems all too patent:

"Still the world seems mounting higher,
Chasing unfulfilled desire,
Spurning barrier, prop and chain,
Scatt'ring darkness, conquering pain,
Winning much, but in each prize,
Some sad germ of evil lies;
For the subtle taint that blends
With all human hopes and ends,
Making good the seed of ill,
Rules the course of nations still."

The physician of the past was the creature of his milieu, and, as ancient medicine lagged almost continually behind the other sciences, his occasional manslaughterings and malpractice did but reflect his ignorance and incompetence and perhaps even blunted his ethical feeling. The confidence and respect accorded to a competent physician

² C. L. Dana: *The Peaks of Medical History*. New York, 1927.

to-day, even in the greater scientific academies of the world, is due in part to physics and chemistry, the *impetus facientes* of scientific medicine, and to the sterling, honorable character of such comparatively recent medical men as John Hunter, who boldly inoculated himself with a dangerous disease, or Bichat, Bretonneau, Laennec, Louis, Bright, Addison, Hodgkin, Virchow, Helmholtz, Huxley, Charcot, Littré, Lister. Names of this particular ethical lustre begin to swarm in the modern period, but appear as rare beacon lights, *longo intervallo*, in antiquity and the not very distant past. An anecdote will illustrate just what this steady increase in physicians of unblemished honor implies. At a medical gathering I once attended, a guest resorted to the trite expedient of reading off the fatal terminations of the Hippocratic case-histories (25 in number) as an example of the killing propensities of our profession. Dr. Jacobi, whom I sat beside, expressed some impatience at this labored expression of "American humor" and went on to say that, in his recollection, hundreds of average practitioners had worked themselves well nigh to extinction, in honest effort to get their patients well. He added that a doctor with a poor reputation for recoveries would soon lose his clientèle. As Billings said: "The public is not always sagacious, but in the long run, it does somehow contrive to find out who are the skilled lawyers and doctors." One recalls a long succession of lay visitors at the Army Medical Museum, whose inquiries on this head were serious to the point of outlining their personal ailments ("money no object"). This being the case, modern medicine, as Dana observes, can endure any satire directed against it with provoking equanimity and "it is well for the knights of the pen to keep a sharp eye upon us and to pull out from the barrel an ancient jest from time to time as occasion requires."

Arranging some of these ancient jests in serial order of time, it is noticeable that each nation and each period had its peculiar line of attack, a view-point all its own. In antiquity, for instance, it is plain that the effective

sharpshooters came, not from the tribal Teutons, Gauls, Slavs or Caledonians, but from fairly sophisticated civilizations. The utterances of China and India suggest, somehow, that medicine in Asia could not have amounted to much before the invasion of Alexander the Great.

CHINA

Medicine is one of the nine low trades. Chinese Folk Proverb.

A single untried popular remedy often throws the scientific doctor into hysterics. Chinese Folk Proverb.

To be a writer requires the wasting of paper: to be a doctor requires the sacrificing of lives. Su Tung Po.

Doctors cannot cure their own complaints. Huai Nan-tzu.

Cow's urine, the excreta of horses and the tops of old drums are collected and sold as remedies. Nan-Yu.

INDIA

Even experienced and capable physicians, fertile in remedies, are tormented and harried by diseases, as gazelles by hunters. In spite of the decoctions and oils they swallow, they are broken by age, as are trees by mighty elephants.

Physicians live by rich patients, officials by unlucky princes, princes by litigants and clever men by fools.

Soldiers long for war, physicians for patients, clay for water, Brahmins for land and beggar-monks for the fat of the land.

Subtle, indeed, are sundry allusions to medicine in the Bible and the Talmud:

He who sins against his Creator must come into the hands of physicians. Jesus Sirach. xxxvi, 38.

In his disease he sought not to the Lord but to the physicians. And Asa slept with his fathers. II Chronicles, xvi, 15-16.

Physician, heal thyself. Luke, iv, 23.

And a certain woman, which had an issue of blood twelve years, and had suffered many things of many physicians, and had spent all that she had, and was nothing bettered, but rather grew worse. Mark, v, 25-26.

Do not live in a city governed by a physician. Talmud, Pesachim 113a.

A physician who heals for nothing heals in vain. Talmud, Baba Kama 85a.

The best of doctors will go to hell. Talmud, Kiduschin 82a.

The Greeks, as Spengler has beautifully shown, existed without reference to the past or the future. Their civiliza-

tion stands apart, like a closed system in physics. Their mathematics was mainly geometry, their historical records of late provenance, their medicine a thing complete in itself. The most extraordinary national culture which the world has known reposed upon a substratum of slavery and the raw blood-thirst of the primitive (*Ægisthus*, *Thyestes*). As Dr. John R. Oliver points out,³ the Hippocratic Oath tells what medicine and the doctor *ought* to be, but what the average practitioner may have been is indicated in *Æsop's* fable of "The Incompetent Physician;" in Plato's account of the slave-doctors who treated slaves and the free-born doctors who found out about their patients from their friends (*The Law*); in *Æschines'* reference to the *Iatreia* as places of ill-fame (*Speech against Timarchus*). The satirical comments on medicine by the greater writers are those of a highly sophisticated intelligentsia, who had their dabbings in faith-cure and "New Thought":

GREECE

Thou hast suffered sorrow and humiliation. Thou art forsaken of thy wits and art gone astray; and like an unskilled leech fallen ill, thou lovest heart and canst not discover what remedies to minister to thine own disease. *Æschylus: Prometheus*, 472-475.

The surest sign of bad government and social anarchy is to find many judges and many physicians. Plato.

Physicians heal those among us whom they wish to heal and injure those whom they wish to injure, by cutting and burning them and putting them to expense as tribute, of which they apply little or nothing to the patients' welfare, and use the rest for themselves and their fellows. In fine, they take money as compensation, even from the patient's relatives or enemies, in order to kill him. Plato (*Politics*, v, 298).

None so stupid as grammarians, excepting physicians. Athenaeus.

Only physicians and judges can kill without being killed. Philemon.

In his youth, Aristotle dissipated his inheritance in debauchery, had to become a soldier, and even played the charlatan by selling quack remedies in markets. Epicurus.

'Tis not a skillful leech, who mumbles charms o'er ills that need the knife. Sophocles: *Ajax*, 581-582.

I am no poor-man's physician, you poor devil! Aristophanes: *Acharnians*, 1027.

³ Oliver: *Internat. Clin.*, Phila., 1927, 37. ser., III, 237-247.

Clearly, there is not a single physician who wishes good health even to his intimate friends, nor a soldier who wishes peace for his country. Philemon.

How bad it would be for doctors if everybody else were well and thriving! Philemon.

Internists are seldom jealous of surgeons, nay they back up and recommend one another. Plutarch.

It is not the affair of a friend but of a sophist to bolster up his own reputation by the failings of others and to swagger in public like the surgeons, who do their operations in a theater to attract more money. Plutarch.

The Roman gibes reflect their definite contempt for Greek medicine.

ROME

Our forefathers did not blame medicine, but drugging and principally because it was plied as a trade to make a livelihood . . . and to this day, it alone, of all Greek arts, is held to be beneath Roman dignity, in spite of its rich rewards. Pliny the Elder, xxix, 16-17.

How many sick people did Themison kill in one autumn? Juvenal, x, 221.

Emperor Tiberius said that a man over sixty who can not take his own pulse is ridiculous, and to ask a doctor what is most digestible is as silly as to ask him what is sweet, bitter or sour. Plutarch.

I hate doctors because they are always making me eat the flesh of ducks. Petronius, *Satyricon* C. 56

It is striking that there is no art so incomprehensible or liable to change its methods oftener than medicine, as there is none other so lucrative. Pliny the Elder, xxix, 2.

Where do we find greater opportunity to poison or to become the inheritor of one's victims than in medicine? Or for adultery, even in imperial houses, as in the case of Eudemus with Livia and Valens with Empress Messalina? But that is not the fault of the art but of its practitioners. Pliny the Elder, xxix, 20.

Crudelem medicum intemperans aeger facit. Doctors are cruel with refractory patients. Publius Syrius.

Male secum agit aeger medicum qui heredem facit. Woe to the sick man who makes a physician his heir. Publius Syrius.

In the Middle Ages, medical practice sank into "almost unexampled degradation" (Allbutt). The clinical textbooks of the time were huge, well arranged and well indexed, but the information conveyed was meagre. Therapy was mainly herbal and showed little advance upon Pliny and Dioscorides, and, unless protected by great nobles and

prelates, the average internist or surgeon had usually the social status of a strolling player or vagabond. Like Chaucer's "parfit practisour," he "loved gold in especial," and took over some of the tricks of Arabian charlatantry to keep his patients or to wiggle out of tight situations. In this period arose the well known epigrams about professional jealousy (*Medicus medicum odit*), the atheistic tendencies of the profession (*Ubi tres medici, duo athei*), the doctor's license to lie (*Medico mentiri licet*) and to kill (*Medicis solis licet impune occidere*), his assimilation to the Cambodians in "Wang" with reference to fees (*Post mortem, medicus!*), as also his obligation to collect fees while the patient was still ailing (*Accipe dum dolet, post mortem medicus olet*). The spirit of Salerno is reflected in the apple-a-day distich of Friedrich von Logau, which Longfellow renders:

"Joy and Temperance and Repose
Slam the door on the doctor's nose."

In the Renaissance period, all the hard things said about the profession were reiterated by Petrarch and by the Welsh epigrammatist, John Owen (1560-1622), who sounded a new variation in the familiar *Dat Galenus opes*:

"Dat Galenus opes, dat Jutinianus honores,
Dumne sit patiens iste nec ille cliens.
Galen gets wealth and Justinian honor, so long as
the first is not sick and the second not a client."

Shakespeare's

"Thou speak'st like a physician, Helicanus,
Who minister'st a potion unto us
That thou wouldst tremble to receive thyself"

was turned about by Bismarck: "Physicians still retain something of their priestly origin: they would gladly do what they forbid." Luther said: "Medicine makes sick patients, for doctors imagine diseases, as mathematics makes hypochondriacs and theology sinners." He despised physicians and seldom (if ever) paid them. Erasmus called them "torturers and harpies." Montaigne observes that the physicians of his time "know their Galen

well and their patients not at all," that "medicine is credited with every cure made by nature" and that "all cures are undertaken at the risk of human life. They carve us, burn us, deprive us of our food and our blood and lo! a step further and we are restored to health." In the 17th century, medical satire was spread upon a large canvas by Molière, who, upon the stage, ridiculed the doctor as never before. A neat gibe was that of Scarron—"*les doctes assassins que nous appellons médecins*"—which preludes the age of intensive blood-letting (up to the time of Louis), when medicine came in for its hardest knocks at the hands of the literary. The old Roman caution about legacies is revived in a line of Crébillon père (*Rhadamiste*):

"Ah! doit-on hériter de ceux qu'on assassine?"

Another observer of the transition period, Leibnitz, introduces a new formula, which was to be copied for nearly two centuries: "I often say a great doctor kills more people than a great general." This was a favorite line of thought with Frederick the Great, who asked Zimmermann: "How many graveyards have you filled?" When Frederick asked another physician if his reputation was not based upon an initial hecatomb of 2000 patients, he met with the unexpected come-back that "the prowess of the greatest soldier of his time may well have cost millions of lives." This was probably the origin of the well worn platitude about the general who has slain his ten thousands. Frederick gave the Chevalier Taylor the title of Court Oculist (at his own request) and then told him that he had no need for his services himself and would hang him if he attempted to ply his art upon any of his subjects. In the same key, Addison opined that "When a nation abounds in physicians, it grows thin of people." Kant said: "Physicians think they do a lot for a patient when they give his disease a name." Lessing has a very modern fling at the sacerdotal aspect of the physician: "Haller, I hear, made it a fashion for physicians to die in the odor of sanctity. It was not always so, indeed a doctor's religion was once more suspect than that of a drama-

tic poet. How times have changed! We may yet see a doctor of theology writing on dysentery." And so it goes, up to the well-known sneer of Mephistopheles in Goethe's *Faust* or the epigram of Sir Astley Cooper: "The science of medicine is founded upon conjecture and improved by murder."

When we come to Voltaire's inquiry, "Who are the greatest deceivers? The doctors? and the greatest fools? The patients," we are well into the spirit of our own period. The essential feature of such medical satires as Samuel Butler's *Erewhon*, Octave Mirbeau's *L'Epidemie*, Jules Romain's *Knock*, Hermann Hesse's *Kurgast* or Michel Corday's *Les Embrasés* is that ridicule is transferred from the doctor to the patients, or at least to the ineptitudes of crowd psychology in encouraging quackery and incompetence in medicine. There is even a faint hint of this tendency in Tolstoi's sombre study, *The Death of Ivan Ilyich*. The patient has become, as it were, *particeps criminis* in relation to his own plight,⁴ at any rate, some sort of a culprit. This is the ironic note in Butler's *Erewhon*: If a person is not in robust health, it is his own fault, an exaggeration which derives, perhaps, from the extraordinary improvement in public health occasioned by the conquest of communicable diseases, the perfection of surgery, gynecology, obstetrics and dentistry, the new science of infant welfare and the revival of Greek athletics. The Greeks and the Romans knew nothing of infection but believed in the healing power of Nature, hence attacked communicable diseases from within by strengthening the body (gymnastics, military training). The Jews, who had a clear notion of infection, attacked the evil from without (segregation in leprosy, diphtheria, gonorrhœa, Mosaic incineration of fomites). The development of these two lines of action is mainly responsible for the vast numbers of sound, healthy and athletic people now seen in civilized countries. At the time when Lemuel Shattuck drafted his famous report on the sanitary con-

⁴ *Crimen quos inquinat æquat.*

dition of Massachusetts (1850), there were vast numbers of people in the United States who had no health whatever.⁵ The people who grin and show their teeth at us in the illustrated supplements of the Sunday newspapers seem like Wilkie Collins' muscular Christians, "too unhealthily conscious of their unconscious healthiness." But the starting point of medicine and hygiene is expressed in the old aphorism of Herophilus, that there is nothing so completely disastrous to an individual as to lose his health. From this angle, let us consider, not too curiously, the brighter side of the past history of our profession, as conveyed in the personal aspirations of great physicians and the more appreciative utterances of great persons about the science and art of medicine. Collected over many years, the following are arranged with references to *manière de voir* rather than to chronologic sequence:

THE ANSWER

Last year, I was afflicted with a grave illness and at death's door. I called in a physician. I can express my thanks for his care and zeal to heal only through your gracious coöperation: I request that he be admitted to the rights of Roman citizenship. Pliny the Younger to Trajan, x, 4.

There is something in sickness that breaks down the pride of manhood. Charles Dickens.

As long as a man is sick and wants to live, he will employ physicians and abuse them. La Bruyère.

Although we jeer
In health, when ill, we call them to attend us,
Without the least propensity to sneer. Lord Byron.

I only take money from sick people. Bretonneau to a hypochondriac.
Every man's disease is his personal property. Alonzo Clark.

I travel through life like a courier, with no place to lay my head, no leisure left to take in the great spectacle of the world and enjoy it. I get into my carriage every morning and leave it in the evening. Maximilian Stoll.

My patients are mostly among the poor, while I went to the country to see my sick children, half a day upwards of fifty knocks at my door, yet

⁵ See, in particular, the admirable study of Gjerset and Hektoen on the desperate plight of Norwegian immigrants into Wisconsin before the arrival of a *bona fide* doctor of medicine from Oslo. *Norweg.-Amer. Histor. Assoc. Stud. & Rec.*, Minneapolis, 1926, I, 1-59.

through all this I am favored with calmness. My lot seems to be cast among misery and death. Griffiths, 1800.

At one time, but three physicians were able to do duty outside of their own houses. From this cruel summer until 1806, no year left us free of the fever, but the worst of it fell upon us in 1798. Benjamin Rush.

Through all of these sad years, we find always ready, always dutiful the best of the men whose lives I have sketched. Scarce one escaped the wounds of disease and at least six died, but none failed us. Surely, this is a record to look back upon with that pride which nourisheth good example. Weir Mitchell of the epidemic of 1798-1806.

My constant routine work in daily practice for sixty years has kept me in solitude, away from the good and great men, ever away from music and literature, and away from those who called me friend. Abraham Jacobi.

The little good I have done is that which has cost me the greatest trouble and has encountered the most numerous obstacles. William Hunter.

My lectures were highly esteemed, but I am of opinion my operations rather kept down my practice. Sir Astley Cooper.

My own success depended upon my zeal and industry, but for this I take no credit, as it was given to me from above. Sir Astley Cooper.

I said in my heart: in this corner you are going to learn or die. Felix Platter.

Rudolphi was no less great as a man than as a scholar—*integer vitae scelerisque purus*. Any one who knew him was bound to love and respect him, and even though his frankness of speech might sometimes hurt a little, one could not long resist his charm. What above everything else he demanded of people was righteousness, honesty of mind and freedom from all unworthy motives . . . In any ignoble mood, I should avoid looking at the portrait of my fatherly counsellor, and it is when I recall the noblest experiences of my life that I think at once of Rudolphi. Johannes Müller.

It reëchoes in my soul like a theme from Beethoven, Schubert or Brahms. Theodor Billroth on the above.

Physicians are better to-day and heal diseases better than in the days of Hippocrates and Galen. Fortunato Fedeli.

Because the newer methods of treatment are good, it does not follow that the old ones were bad: for if our honorable and worshipful ancestors had not recovered from their ailments, you and I would not be here to-day. Confucius.

In medicine, sins of commission are mortal, sins of omission venial. Tronchin.

Medicine is as old as the human race, as old as the necessity for the removal of diseases. Heinrich Haeser.

The methods of quackery are merely a theft from the most ancient phases of folk-medicine. Sudhoff.

Science is the topography of ignorance. O. W. Holmes.

But like a man walking alone in the darkness, I resolved to proceed so slowly and with such circumspection that, even if I did not get very far, I was certain not to fall. Descartes (*Discours de la Méthode*, II).

Medicine absorbs the physician's whole being because it is concerned with the entire human organism. Goethe.

The education of most people ends upon graduation; that of the physician means a lifetime of incessant study. Marx.

To support and help others on occasion is every one's whim. It is the chief end of the doctor's existence. Marx.

Almost every one who goes to bed counts upon a full night's rest: Like a picket at the outposts, the doctor must be ever on call. Marx.

He, who has no notion of the inconceivable wealth of proven experience and helpful wisdom which is in medicine, may censure it as fragmentary, under the delusion of extenuating his own ignorance. Marx.

For thousands of years, medicine has united the aims and aspirations of the best and noblest of mankind. To depreciate its treasures is to discount all human endeavour and achievement at naught. Marx.

In the records of no other profession is there to be found so large a number of men who have combined intellectual préminence with nobility of character. Osler.

In all periods, science has been advanced by individuals, never by the spirit of the age. The spirit of the age condemned Socrates to hemlock and burned Huss. Vaugenargues.

There are centuries in which public opinion is the most imbecile of all opinions. Chamfort.

Even in populous districts, the practice of medicine is a lonely road which winds uphill all the way, and a man may easily go astray and never reach the Delectable Mountains, unless he early finds those shepherd guides of whom Bunyan tells, Knowledge, Experience, Watchful and Sincere. Osler.

It was a magnificent moonlight evening and sitting up in the fifth story. I looked down on the city and tops of the trees and of course was sad. J. S. Billings.

I thought that all was right in the system of the universe—that consistent with our desires and passions was the shortness of our life and our being liable to suffering and disease—that without this we should have been inanimate, cold and heartless creatures. Sir Charles Bell.

Medicine was once the intellectual home in which I grew up, and even the emigrant best understands and is best understood by his native land. Helmholtz.

All knowledge attains its ethical value and its human significance only by the humane sense in which it is employed. Only a good man can be a great physician. Nothnagel.

A skillful physician can revive the springtime of life. Chinese Proverb.

Medicine is a sacred calling and he who make it ridiculous is guilty of sacrilege. Sudhoff.

If there is any possible means of increasing the common wisdom and ability of mankind, it is to be sought in medicine. Descartes (*Discours de la Méthode*, II).

Certainly physicians cannot prolong our lives by a single day: We live as long as God wills; but it makes a great difference whether we live miserably, like poor dogs, or keep well and fresh, and here a wise physician can do much for us. Goethe.

When I was young, patients were afraid of me; now that I am old, I am afraid of patients. Johann Peter Frank.

When controversy bursts forth, the first one to become silent is assuredly of good family. Talmud.

To connect accurate and faithful observations after death with symptoms displayed during life must be in some degree to forward the opportunities of our noble art. Richard Bright.

The poet is grieved by the indifference of his contemporaries, but the physician seems to be made philosophical by the steadying influence of every-day work, so that not Marcus Aurelius could have been more content than Auenbrugger, whilst a half-century passed by neglectful, and would not see the more than royal gift he offered to mankind. I am glad to think he was happy and to know that for all of us, as for him, this incessant everyday work is a talisman of content. Weir Mitchell.

So much of aspiration, of social ostracism endured, of obloquy repelled, of inestimable service rendered *gratis* to the poor, of incessant study, of intensive thought,

“Of labor that in lasting fruit outgrows,

Far noisier schemes, accomplished in repose”—

all these and more have gone to the simple proposition which Trousseau regarded as the chief aim of medicine, namely: “Get that patient well.”

F. H. GARRISON

ADDRESS OF THE RETIRING PRESIDENT

THE ACADEMY AS AN EDUCATIONAL INSTITUTION *

SAMUEL W. LAMBERT

It is my duty to report on the activities of the Academy of Medicine for the past two years during which it has been my privilege to serve as your President. I wish at this time to emphasize the influence of the Academy on medical education in New York. The Academy of Medicine has developed during the eighty years of its existence from a small medical club of local interest to the physicians of New York as a means of mutual conference and consultation concerning the science and art of medicine, into an educational institution of ever increasing influence over a constantly widening area.

In fostering the education of physicians of all ages the Academy has never taken part in the training of undergraduate students. Nor has it ever been a school for the intensive teaching of graduates and it never will be. The lectures presented at its stated meetings, the clinical demonstrations given by its twelve sections are open to the general medical public and to any others who may be interested. No fees and no tickets of admission are required. All the public work of the Academy is directed through two principal Committees, one on Public Health Relations and the second on Medical Education. Both Committees are essentially educational in their interests and work.

One of the least evident but most useful forms of activity is found in the Bureau of Clinical Information which keeps a daily bulletin of operations and clinics in a prominent position near the entrance of the Academy building. Some hundred operations in seventy-five hospitals are posted daily. In addition the Committee investigates all courses and clinics offered to graduates and

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gives its endorsement to those proven to be well-organized with adequate clinical material and equipment and conducted by clinicians and qualified teachers of known ability. Seven hundred and thirty-five visitors from out of town including one hundred and seventy-seven from thirty-five foreign countries registered in this bureau during the year.

The third course of practical lectures is being given weekly with an average attendance of 150 practitioners. The Bulletin of the Academy is published monthly in an edition of 2000 and presents in full the prominent papers read before the Academy and a resumé of the shorter communications of practical clinical value.

A closer relationship between the Academy and the Harvey Society has been brought about and the Harvey lectures will replace some of the stated meetings to the end that a greater scientific interest will be cultivated in all the proceedings of the Academy.

The Academy has accepted the responsibility of awarding at such intervals as it may determine a medal to be known as the Academy Medal. The conditions of the gift of a die and of an endowment fund to support the proposal as laid down by the donor, Dr. Samuel McCullagh, are broad and leave all detail to be decided from time to time by the Council. The award of the medal is to commemorate Distinguished Service in Medicine. Such an endowment by which prominent achievement by medical men shall be recognized and accentuated in a public manner by this scientific association of physicians cannot fail to prove to be a stimulus to work and study for the whole profession.

It was a privilege for this Academy to present on this platform the presiding judge of the Court of Appeals of New York State on the occasion of the Anniversary Discourse last November. In speaking to his chosen subject, "What Medicine can do for Law," Judge Cardozo reached a plane of thought which held his audience of lawyers,

physicians and laymen in strict attention while he developed the interrelation of law and medicine in the problems of crime, insanity and the deeper causes of irregular behavior in more careful detail than is usually evident in the routine either of hospitals, courts or correctional institutions. The address will soon be published in an appropriate form and given a wider public consideration than was possible in this assembly hall.

A new departure in the education of the profession was inaugurated this past fall when the Academy devoted the first two weeks of October to an intensive presentation of the subject "The Problems of Old Age." Daily lectures were given in the late afternoon and evening, and clinics were held at many hospitals in the morning and early afternoon hours. The attendance, as with all the functions of the Academy, was open to the public and the profession and without fee or admission ticket. It is felt by the Council that the experiment was a success and it will be repeated next fall when the subject of "Functional and Nervous Problems in Medicine and Surgery" will be presented in a similar thorough manner.

Another new relation has been created and the County Medical Society has joined with the Academy to create a Medical Information Bureau which is designed to give quickly to the public press reliable statements concerning new discoveries and medical problems which may arise in such daily occurrences as have the peculiar character of "news." Both the organized society of the county and the Academy hope that the natural development of this bureau will result in the publication in the newspapers of more trustworthy news of a medical nature than has sometimes been the fact in the past.

About half of the cubic contents of this building is occupied by the Library of the Academy. The Library contains some 300,000 books and pamphlets and is the chief factor in promoting education by the Academy. There is no other public medical library in Manhattan. A very excellent library is maintained by the Medical Society of

Kings County and the medical schools and several hospitals also have smaller reference libraries for the use of members, students and professional staffs. The great Public Library of the City at 42nd Street and Fifth Avenue does not maintain a division of medical literature. The Academy appreciates its duty to the public as the owner of its collection of books and has extended the number of hours for attendance by the general public. It still reserves the evening hours for its Fellows and associate members. It is my opinion that this slight restriction of time for outside readers should be completely abolished.

It has been frequently said that old medical books are of no value except as waste paper. The Academy cannot endorse this view and its librarian is an enthusiastic collector of books of historical interest in tracing the growth and development of medical science. During the past year the notable collection of such books collected by Dr. Edward Streeter of Boston came into the market and the Academy, through the gifts of many friends and its own Fellows, was fortunate to secure the entire lot. This has added much to the historical value of the Academy's Library. An exhibition of medical incunabula is now on view in the Library and presents a very accurate survey of what the oldest medical books mean and represent. One of the happy results of the collection of the funds for this purchase was the formation of a separate endowment the income of which is to be devoted to the purchase of similar books of rarity and interest. This rare book fund amounts to over \$17,000 at the present time and it shall be my special endeavor to see it grow in the future.

It is my pleasure to express to you my appreciation of the honor you have done me in electing me to this office and to thank you for your confidence and coöperation. I assure you that your Academy has still before it an even greater future than its past. It is with great confidence and enthusiasm in that future that I turn over the duties of the office to my elected successor, Dr. John A. Hartwell.

ADDRESS OF THE INCOMING PRESIDENT THE ACADEMY, THE PROFESSION AND THE PUBLIC *

JOHN A. HARTWELL

DR. LAMBERT, FELLOWS AND GUESTS OF THE ACADEMY:

The men who founded The New York Academy of Medicine in 1847 had unusual vision as to the value of such an institution to the profession and to society. In the years following, men eminently fitted to carry out this vision were called to its leadership and, therefore, one who has received the honor of becoming your President, is keenly alive to his limitations and to the responsibilities which accompany that honor. That you have seen fit to entrust the Presidency to me, gives me courage to believe that your support is assured. In this belief I undertake my duties with the hope of continued success; and it is with such hope that I express to you my deep appreciation of your confidence. The inaugural and valedictory addresses of such men as John Francis, Valentine Mott and Samuel Purple, give to their successors an abiding faith in the ideals and standards of our Academy. Through all that these men say, there runs a thread of earnestness which is as inspiring to us, as it was to the Fellows of nearly a century ago; and the growth of the Academy from its modest beginning, in the Lyceum of Natural History, to its present commanding position, is directly traceable to the inspiration given it in those early days by these Masters.

The Academy has always endeavored to foster those relations between the profession and the public which will most surely fulfill the needs of the latter in all that pertains to its health. The first object as expressed in the original constitution was "The Separation of the Regular from the Irregular Practitioners." The early presidents voiced in no measured terms the menace to the people.

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which they conceived as existing in the practices of the latter. While the acute situation which made such a declaration necessary at that time no longer exists, the problem in a modified form, is still before us. Irregular practitioners whose practices are founded on misconception are sanctioned by law, and it is no less essential to-day than it was when our constitution was first written, that this menace should be removed. Repeatedly we have coöperated with other organizations in an attempt to prevent unqualified practice from being legalized, but not always successfully. The public, seeking relief from ill health, is not quick to differentiate accurately between those practitioners who have labored for a sound basis of education, and those who claim peculiar curative ability without such education. The fact that the latter are in many cases able to establish their claims and give the relief sought, adds a difficulty to the problem. Opposition to such practitioners by the regular profession is not infrequently ascribed to an ulterior motive, and a portion of the public is convinced that the unqualified, whether they be science healers, osteopaths or chiropractors, are to be ranked with the qualified members of our calling. The remedy for the evil lies in making the stand of our profession fully comprehended. The platform on which we unanimously are agreed is so simple that it ought to be easily understood. The Academy voices this platform, namely, that the method of therapeusis to be employed in any case rests with the practitioner employing it provided that practitioner has qualified for this responsibility by those educational requirements which we demand from ourselves.

The public must be made to comprehend this simple formula and this can only be brought about by definite effort. We ought not to stand by in an unconcerned attitude while any portion of the community rests its faith in health matters on the teaching of ignorance. That an intelligent individual who has confidence in, and admiration for, a highly trained physician often places himself in the care of a man whose knowledge of the human body is prac-

tically non-existent, argues a fundamental lack of understanding. The success of the unqualified lies almost wholly on the acceptance of the *post hoc propter hoc* fallacy of reasoning. Because a chiropractor by manipulation relieves a pain, is no reason to believe that he is competent to be one's advisor as to when such manipulations are needed, or that he is a safe counsel on matters of health. Again, because a mental or science healer brings comfort to a patient suffering from acute or chronic disease is no evidence that such a healer is competent either to diagnose or give efficient treatment to that disease. On the other hand, the medical profession cannot neglect to utilize what is valuable in both physiotherapy and mental hygiene; two fields of therapeutics which have not received the attention to which they are entitled. Every patient who seeks treatment from unqualified practitioners represents, to some extent, our failure and thus it is doubly incumbent that we leave nothing undone to raise our own practices to the highest efficiency.

No physician in this community is without the means of keeping fully abreast of the times, if he avail himself of the post-graduate privileges which the Academy either gives in itself, or puts at his disposal. An analysis of the subject matter of the papers which have been presented before the Academy and the sections during the past five years shows a remarkably balanced relation between clinical, laboratory and research problems and these alone make an impressive course of graduate study. In addition the Committee on Medical Education gives its approval to post-graduate courses throughout the city which cover all branches. Thus we are discharging the intentions of the founders more fully each year and in this we cannot do better than to follow the precepts of those who have built up its traditions. The following quotation from Dr. Francis is not without present value:

"It is most remarkably the case in our science, that however brilliant may have been the imaginations of those who have endeavored to promote the Hippocratic art, none

seem to have secured a perpetuity of fame who have not most scrupulously adhered to the inductive system of philosophy, first adopted by Hippocrates himself, afterwards enforced with all the rhetoric and amplitude of truth by Lord Verulam and exemplified in the writings of Sydenham, Boerhaave, Haller, Huxham, Rush and other distinguished ornaments in our profession. The disastrous issues which have marked crude and untenable theories in all ages must perpetually admonish us that on facts alone can our science be erected: and he alone is to be deemed the benefactor of our art who wisely makes use of a cautious experience."

These old-fashioned truths, clearly expressing the spirit of those who gave the initial impetus to the Academy, were spoken by Dr. Francis on February 2, 1848 when he was inducted into office as its second President and are certainly as applicable to-day as then. The rapid advances in the biological sciences have placed at the disposal of the physician many means of combating disease which rest on infinitely complex principles. The temptation to utilize these means without sound reasoning and the use of a cautious experience, if yielded to, can only lead to disastrous issues. Unless we can create an atmosphere for our profession which precludes crude and untenable theories from being the basis of incompetent practice, we fail by that much in the ideal before us. It is the duty of this body to allow no such to emanate from the Academy without challenge.

Fifty years later, at the Semi-Centennial, our own greatly beloved contemporary, Dr. Jacobi, opened a vista of usefulness when he said, "The time will soon come when the culture of a nation will be estimated according to the mutual relations of medicine and the people. Is this an ideal? It is, but no Utopia. Indeed, much of what was an ideal twenty-five years ago has been achieved. It is probably true, however, that no ideal ever will meet with its entire consummation, and ideals will be modified and expanded. Nor do I believe that even the star guiding

and its vicinity and aiming to elevate the standard of medical education."

The character and honor of the profession are the foundation stones of the whole structure of medicine. This structure has been erected on the conviction that doctors are concerned in giving unselfish service to the public. This is our sole title to whatever of peculiar distinction we may enjoy. We are assailed on every side by the temptation to become rivals of those who worship at other altars. Particularly is this so in a large wealthy community like ours, where material advancement yields such patent rewards. Strength of character and an abiding faith in things not seen are required to guide one's footsteps along the paths that have been laid out by the great and good men of the past. One such, whom I just quoted, defines the star which leads us along that path as the "improvement of man, both individually and collectively." Unless we can find satisfaction and reward for a life of hard work and more often than not, real sacrifice, in the consciousness of striving toward such a star, we cannot hope to enjoy the high esteem that has been accorded to our leaders in the past. No brilliance of intellect, no accomplishment of mind, no accumulation of wealth has ever elevated any physician to be the respected and beloved colleague of the profession or the idolized friend of his fellow-men unless these have been associated with a devotion that places a desire to help above them all. This Academy stands as the champion of this conception of our privilege and our duty. We are called upon to uphold the highest traditions of the character and honor of our profession. How then shall we meet the harassing questions which are before us so as to reconcile our just need of material reward with the equal need of maintaining medicine on a high plane of endeavor? If we arrogate to ourselves the function of "improving mankind individually and collectively," particularly in healthfulness, we are forced to acknowledge that our fellow citizens have a right to demand that each one of them shall receive at our hands what is necessary, that he may enjoy good

health, in so far as the science and art of medicine can give it. Provision must be made for those who need this, without cost, or at a cost within their means to pay, as well as for those who are amply able to give financial return for the service rendered to them.

Medical men in this city and in the entire country are faced with these grave and important questions of economics. These questions must be solved in such a way that the health of the public and the individual is safeguarded. This must be accomplished by means that will neither deprive the physician of just compensation, nor lower the dignity and influence of his calling. It is recorded that when the question of establishing a Department of Health in this city was first broached, a not inconsiderable portion of the medical profession opposed it on the ground that it would deprive physicians of a legitimate field of activity. Wiser counsel prevailed and the more thoughtful doctors recognized the right of the public to this protection. The Academy was a prime mover in establishing this city department. But at a later time, when Hermann Biggs moved for the reporting of tuberculosis as a communicable disease, the Academy was found on the wrong side of the argument. No one at the present time would have the hardihood to argue against these things or to argue that their introduction into our life has in any way worked detrimentally to the practicing physicians. We must have it clearly in our minds that the people, largely by our efforts, have come to set the highest value on health. They have learned through the ages that this is an essential asset in any undertaking. Moreover, they know that the Science of Medicine is capable of accomplishing definite results toward giving them this asset and, finally, they look to us to translate this science into practice. Their need is such that they will strive for this service without any serious consideration concerning the economic principles involved. It is in answer to this urge that the profession and laity interested in these problems, have brought about the enormous growth and use of hospitals and out-patient departments in recent years. These

institutions primarily came into existence for the care of the indigent only. It gradually developed that the hospitals were equally fitted to give service to those who could afford to pay for it, and that in many respects, this service could be given more effectively than at home, or in the doctor's office.

From this grew the common knowledge that the poor and the rich were much better situated to receive adequate care than that great class of self-supporting persons of small margin of income. In recent years both the hospitals and out-patient clinics have been giving serious thought to the needs of this class. Semi-private rooms and wards, where a reduced charge is made to bed patients, both for accommodation and professional service, help to solve the problem for this group, and part pay or full pay clinics for the ambulatory group.

Very recently the growth in these latter clinics has been rapid and some concern is expressed that there lies herein a danger to the economic status of the practicing physician. A portion of the profession senses a distinct menace and this portion is organizing to impose a definite limitation to these activities. Such are demanding that pay clinics be abolished, and that hospitals throw their wards and rooms open to all qualified physicians for some part, greater or less, in the treatment of patients who pass from their care to that of the hospital. Opposed to this group are those who have had an active part in bringing about these developments and who see in them a definite step forward in fulfilling the responsibility, if not the obligation, which rests upon us. The problem will not be solved by the argument that the earning capacity of doctors will be lessened by these undertakings. Patients seek treatment in these institutions because their experience makes them believe they can secure better care in them than can be secured in the private offices which are at their disposal. We must realize that the average prospective patient has no means of knowing where he may find adequate treatment within his ability to pay for it. He is not in-

formed as to the relative merits of different doctors and until we can accept as a premise that he will necessarily fall under the care of a careful and competent physician, we must feel sympathy with those who seek relief from an institution operated, in most instances, by a carefully selected personnel.

Applicants give it as a common reason for seeking treatment in one of these institutions where careful records are kept, that they have failed to find relief in one or more private offices. Other things being equal, the public prefers the service of a private doctor to that of a clinic, and the latter may well act as a stimulus to the former to do his utmost for his patient. But we cannot fail to recognize that such institutions are capable of organization along lines that give them advantages over the individual in the matter of complex study and methods of therapy. If, therefore, these newer developments are able to meet a just demand in the most efficient manner, the public will seek them the more insistently. Unless we provide them voluntarily, they will be forced upon us, because we cannot defend the position that any group shall be deprived of the best service which can be furnished, so long as we stand on the platform that we are responsible for the health of the community.

Our problem lies in finding a means whereby these aids shall not constitute an unfair discrimination against the profession at large and thus ultimately operate to the disadvantage of the public, since it must be accepted as a truth that anything which is inimical to the medical profession, in the end will be inimical to public interest. The answer then, does not lie in restriction or prohibition, but in regulation which will fulfill our duty of service and enlarge our usefulness without endangering our rights or our influence. It is my belief that self supporting clinics, medical centers and hospitals with self contained medical staffs may be so organized that they will prove to be of definite advantage to the entire profession, and in no wise unfair competitors.

Already our Committee on Public Health Relations has given serious thought to the "open hospital" question and a report of their findings with recommendations, to which I ask your careful consideration, will appear in the Bulletin. It is not proper at this time that I should formulate for the Academy any policy which will take what is good and eliminate what is bad in these newer trends. This can be arrived at only after careful study of the principles involved. But it is entirely proper that I urge upon the Academy and the Fellows, as individuals, that every effort be made to understand these principles and to help solve the problems in accordance with the high ideals of our profession and the needs of the people. This certainly is a function of the Academy by virtue of its position in the city and the country.

Other matters calling for thoughtful consideration pertain to the mutual relations between the general practitioner and the specialist (including the surgeon) and between them and the patient. The practice of medicine has become of such complexity that the general practitioner is required to call upon the specialist for many services that formerly he accomplished himself. Special knowledge and special training in all fields of activity command a higher compensation than the unspecialized, and thus the cost of medical care to the patient is steadily increasing. This has been an important factor in the development of group practice and of the highly organized self-supporting clinics already mentioned. The general practitioner is an essential link in the work of the specialist. He determines to a large measure, oftentimes after exhaustive study, that the latter is needed. He selects the individual specialist to carry out the necessary procedure. The doctor's compensation for this preliminary study and advice is in most cases small in comparison to that of the specialist whose service is often of short duration. To offset what is looked upon as an unjust discrimination, the wholly evil practice of fee-splitting has grown to alarming proportions. In essence, this amounts to the family doctor receiving a rebate from the specialist for a service for which

he is charging a separate fee, without the patient knowing that such a rebate is being paid. It results in two evils: First, the selection by the family physician of a specialist who will pay the rebate, which may readily lead to employing a less qualified man than would otherwise be obtained, and, second, an increased charge by the specialist in order to cover the unacknowledged rebate. It is a secret understanding between two professional men which they dare not bring into the open. No right-minded man can justify this, and disaster, if not disgrace, threatens the profession if it be tolerated. It is quite beside the mark to say that the family doctor is underpaid and the specialist overpaid. The correction for this, if it exist, lies in a readjustment between the two with the patient having full knowledge as to what he is paying each and for what service. Again, I am not in a position to commit the Academy to any policy in meeting this condition, but it is entirely proper that I should ask your very serious consideration of the problem with a view to a solution that will establish a just relation within the profession and between it and the public.

Your retiring President has presented to you the accomplishments of the two years of his administration. It is a record in which we may justly feel a pride and for which we tender to him our sincere congratulations. To carry on in an equally efficient manner will tax our utmost efforts. Under Dr. Lambert the various departments have shown continued enlargement of their sphere of action and have solved many of the problems coming before them. I have asked the executive heads of these departments to briefly outline matters that need consideration and action in the near future. Time will not permit that these be given in detail. They all tend toward an increase in our expenditure and Dr. Williams informs us that for the first time in five years the requests for budgetary allowances are in excess of our anticipated income.

The great effort that has been put forth in the recent past to finance the truly astounding expansion which has

taken place, has shown of what the Fellows are capable. The Academy has now risen to a position of commanding importance in the city, the state and the country. It ranks with other great undertakings which touch the lives of our people. It lies with us to continue to present its needs in such quarters and in such terms as will be translated into ways and means of carrying forward its functions. It lies with us to demonstrate that these functions, properly carried forward, are of a value to the community commensurate with the cost. I therefore earnestly appeal to you once more to take a part in this presentation, and interest those who have the means to come to our continued support. The proper housing of our incunabula and other treasures of the library, possibly in the current journal room which must then find new quarters; and the introduction of research workers in the Library, and the fields of public health and education, are among the projects that must receive consideration. Our Library has all the facilities for instruction of students and the profession, in the uses of books and for training librarians for other institutions. The personnel to carry on this work must be provided.

This country is entirely lacking in schools of forensic medicine. The National Research Council has discussed this need with our Committees on Public Health Relations and Medical Education. These in turn have given thought and effort to an inauguration of the idea, which will be continued next year. Additional personnel will be required to bring this matter before municipal and state officials, so they will see the need of trained men in this field and before educators so that such men may be available when the call comes. As Dr. Foster, the Chairman, expresses it, "Two ends are to be achieved simultaneously."

The value of a medical museum, with a library of lantern slides, x-ray films, educational charts and other aids to dissemination of knowledge should develop into a most valuable contribution to our influence on education. From

time to time your officers will take occasion to discuss these undertakings more specifically, but they are called to your attention now, in order that you may give thought to our needs and formulate means of meeting them.

I leave for your consideration this theme:

The Academy of Medicine, founded nearly a century ago, was created to meet very definite needs of the profession and the community, by a group of far-seeing men who builded the foundation so well that a structure of truly beautiful proportions has arisen. This structure is our heritage and we may enjoy our privileges only if we take, with them, a full sense of our obligations. The Academy is more than a collection of books and an educational forum, invaluable as these are. It possesses traditions of rare fineness, the growth of the spiritual influence given to it by generations of noble men; these it dedicates to the service of the people. We are called upon to keep these traditions unsullied and to be guided in our actions by a reverence for that which is noble in the "character, interests and honor of our fraternity" and for that which endows us with the "power of benevolence, beneficence and mutual assistance."

In accepting the great honor of being asked to become your leader in this dedication and in this reverence I earnestly voice the hope that the limited qualifications which are mine will be stimulated to the utmost by your example, and that together we may not falter in the high undertaking to which we are called.

A STUDY OF THE STREPTOCOCCUS IN
THE ETIOLOGY OF ARTHRITIS *WITH
DEMONSTRATION OF ARTHRITIC LESIONS
EXPERIMENTALLY PRODUCED

REGINALD BURBANK

It is scarcely pertinent to this paper to go into the older theories as to the aetiology of chronic arthritis, but it does seem of importance to state that until the year 1887, the humoral and neural theories of causation held almost undisputed sway. Mantle at that time put forward the viewpoint that rheumatic fever is an infection and that the organism, a micrococcus, obtains entry through the tonsils. He described this organism as a coccus which he claimed to have isolated from both the blood stream and from joint effusions and was able to grow outside the body. This work probably paved the way for the launching of Max Schuller's microbial theory of the causation of chronic arthritis in 1892, basing his contention on the fact that he had discovered micro-organisms in the synovial fluid of chronically diseased joints. Further research along these lines has given us a mass of rather conflicting data with each investigator assigning some particular bacterium as causative agent.

The majority of the arthritic lesions, experimentally produced in animals when strains isolated from human cultures have been used, are rather misleading, as the lesions produced have been almost without exception acute ones and the joints have been of the purulent type instead of the chronic, indolent, progressive involvement so characteristic of arthritis in the human. The work of Triboulet, Coven, Wassermann, Beaton and Walker, Ryffel, Lewis and Longcope, Poynton and Paine, and Rosenow did a great deal, however, toward establishing the infective theory of acute rheumatic joint involvement and

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naturally led to extended investigation of the same causative agents in chronic arthritis.

T. W. Hastings, some sixteen years ago, employed the old Wassermann technique in testing the blood of chronic arthritics for antibodies against streptococci and opened an important additional field for investigation from the standpoint of bacterial aetiology. We have elaborated on this work using active serum and employing the patient's native complement, making use of many different strains for antigens instead of a single one as in the early work, and our findings convinced us that the streptococcus plays a very distinct pathogenic role in the causation of this protean disease. Many thousands of complement fixation tests led us to feel confident that whatever other factors might be involved in the production of arthritis, the streptococcus was practically a *sine qua non* of the disease.

Since the presence of immune bodies presupposes the presence of an active infective focus draining, from time to time, into the general circulation, we sought to prove the culpability of the streptococcus by attempting to isolate it from the blood stream of arthritic patients and also from the joint fluids of chronic cases.

Routine blood cultures were made on every patient examined but the investigation was for a long time a fruitless one and would have been utterly discouraging had it not been for the fact that freshly taken hanging drop examination of blood under the microscope sometimes showed ill-defined diphtheroid and streptococcus-like forms similar to those observed in septicaemia patients with positive blood cultures. We felt that we were dealing with viable streptococci and that failure to grow them must be due to some inhibiting substances in the blood itself, and if a bacteriolytic action existed, it was due, at least indirectly, to the presence of alexin. The next step was to neutralize this alexin. Peptone was found to be the agent best adapted for this purpose. Gradually we adopted a technique which consists of using 10 c.c. of a sterile ten per cent peptone solution, and ten minutes to half an hour

before the blood for culture is taken, neutralizing the peptone with $\frac{1}{2}$ c.c. of sterile 1 per cent sodium carbonate solution. The blood is then taken under sterile precautions, and 1 c.c. is added to the peptone-carbonate mixture, gently shaken, left for half an hour at room temperature, and then incubated.

The following morning a pour plate is prepared by gently shaking the blood-peptone mixture to give uniform distribution of cells, mixing 2 to $2\frac{1}{2}$ c.c. with 2 per cent nutrient agar at a temperature of 39 to 40 degrees Centigrade, and pouring in a petri dish. After the agar has set firmly, the plate is inverted and returned to the incubator, the temperature of which should be held at 37 degrees.

Each day a new plate is poured from the blood-peptone mixture until the whole has been used. The plates are marked according to their respective dates, and are examined daily. The first or second plate is most apt to show growth when positive cultures are obtained and colonies appear anywhere from the second to the fifteenth day.

There seems to be a distinct seasonal influence on the bacteriological findings in the type of cases we are dealing with. The best season to obtain positive cultures in our experience has been the late fall and early winter months. In the latter part of October and early November the bacteria isolated usually belong to the diphthero-streptococcic type of micro-organisms. These organisms do not ferment any of the sugars, and if distinctly of the streptococcic morphology, are *ignavus*, according to the Holman classification. Even with a definite diphtheroid morphology further transplantation causes some of these organisms to change to definite streptococcic type, without changing their sugar fermenting properties.

In the latter part of November, all of December, and most of January, true streptococcic types appear.

The types we have isolated from our *arthritides*, during these months, fall into major groups of *faecalis* of the

green streptococci, and *infrequens* in the hemolytic. Only scattered findings of *mitis*, *salivarius*, *equinus* and *subacidus* have been found.

We presume that the latter types may be due to sore throat, and allied infections occasionally giving a temporary septicaemia.

During the months of March, April and throughout the summer months, all cultures have been negative.

When we are dealing with the diphtheroid type of organisms the poured plates usually show innumerable minute non-hemolytic colonies uniformly scattered throughout the media; but streptococci when found usually show only a few colonies to a plate.

The growths obtained during the late fall and winter months, exceeded our most sanguine expectations, for contrary to previous findings when positive blood cultures of streptococci were isolated only in septicaemias with septic temperatures, pure cultures of low virulence streptococci were obtained from the blood streams of afebrile arthritics who were able to carry on their daily routine of life with no other symptoms than their swollen or painful joints.

The evidence seemed to point to the fact that we were dealing with types of streptococci, both hemolytic and viridans, quite different from those found in the febrile septicaemias. Morphologically these blood culture strains are identical with other streptococci though the chains are rather short. Biologically they grow fairly well in ordinary media once they are isolated and subcultured. They are facultative aerobes. They stain well with ordinary dyes and retain the gram stain. On solid media they grow like other streptococci in fine pin-point colonies and on blood plates certain strains give a clear cut hemolytic zone about the colony while others give a fairly large zone of methemoglobin discoloration like ordinary viridans blood cultures. In different sugar media both hemolytic and viridans types regularly ferment lactose,

mannite and salicin but may or may not ferment raffinose and inulin. In eighty per cent of our positive findings, we were able to link the hemolytic strains with *infrequens* and the viridans with *faecalis* according to the Holman classification. The remaining twenty per cent show various types according to the sugar fermenting classification.

While doing the blood culture work we were able to obtain positive cultures from aspirated joint fluids in several chronic arthritic cases and the same sugar fermenting properties were found in these cultures as in the majority of the blood culture strains.

For a number of years bacterial examination of the stool and culture of pathogenic organisms found therein has been an office routine for every patient. Many of these cases had no apparent foci of infection remaining. Stool cultures were made routinely by inoculating one tube containing 10 c.c. of a one per cent sodium carbonate solution with one platinum loopful of stool and incubating over night.

The following morning a blood-agar pour plate is made by inoculating blood-agar mixture with one small loopful of the carbonate growth. This is allowed to remain in the incubator until the day following, when, in the presence of streptococci, deep pin-point colonies will be present in myriads. Sugar fermenting properties are then studied by isolation and inoculation in various sugar media.

These stool cultures gave us evidence that the majority of streptococci found in the intestinal tract came under the same sugar fermenting classification as the blood culture and joint fluid strains. It is interesting to note that well over 90 per cent of all definite arthritic cases had pathogenic streptococci in large numbers in the intestinal tract.

We felt that if it were possible to inject our blood culture organisms into animals and produce lesions similar

to those originally found in the human from whom they were isolated, a long step had been taken in inculcating streptococci as definite factors in the causation of chronic arthritis. As direct evidence we inoculated various animals, including guinea-pigs, mice and rabbits, with blood culture strains akin to the *infrequens* and *faecalis*. The results with guinea-pigs and mice were negative as far as joint involvement was concerned, but in due course of time chronic arthritic changes began to appear in the inoculated rabbits. The early experimental work along this line has already been published in the April, 1927, number of the *Journal of Bone and Joint Surgery*, but since then we have continued the experiments with an extended series of rabbits where the strain from the human blood culture has been injected into the rabbit reproducing the disease in all its chronicity without showing either pus formation or acute suppuration in the joints. The injected organism has then been isolated from the arthritic rabbit; repassed to another rabbit; similar symptoms produced, isolated again, repassed to another, and so on, reproducing chronic arthritis at will and fulfilling the requirements of Koch's postulates.

The method of inoculation employed is to take 1 c.c. of a twenty-four hour growth of the hemolytic *infrequens* and inject intravenously, one injection usually being sufficient to produce evidence of beginning joint involvement in a few weeks' time.

With the *faecalis* the initial injection is given as with the *infrequens* but subsequent injections, every second day, are given in saline suspension for four or five doses to avoid the toxic effects of the repeated use of broth. The necessity for repeated injections would indicate that the *faecalis* is the less virulent organism.

The symptomatology of the inoculated animals is, *first*, a two or three day septicaemia during which the inoculated organism can be isolated from the animal's blood stream by culture.

Then there seems to be a localization according to the selective property of the organism, the wrist joints being most frequently affected; this localization may take anywhere from a few days to a month.

The severely afflicted animals have a tendency to lose weight despite the fact that they eat normally and do not appear to be affected physically except by the joint manifestations.

The animals protect the involved joints by holding them up to prevent weight bearing.

Objective signs of swelling gradually appear and tenderness is evident, for if the animal is frightened and moves suddenly, it emits piteous little cries which are not uttered if slow movement is made as the joints seem then to be protected by muscle spasm.



Fig. 1.—Rabbit B. Normal control upper extremity.

The x-ray gives direct evidence of the exudative, atrophic or productive changes that are going on, and in certain animals, destructive, productive and exudative changes can be shown in the same joint.

Microscopical studies of sections from autopsied animals show exudative changes, decalcification, proliferation and destruction of cartilage. Some animals have joints with the epiphyses showing changes analogous to those of rickets. Decalcification and recalcification of the bone may be co-existent. There may also be fibrous tissue formation sufficient to give a fibrous ankylosis. Muscular degeneration and atrophy is frequently marked and simi-



Fig. 2.—Rabbit No. 6. Acute exudative-atrophic wrist joint with ulnar deviation.

lar to aniso-atrophic or deforming arthritis in the human. The extreme deformity produced, similar to that found in the human, coupled with aniso-atrophic muscular involvement, seems to be a direct toxic action on the muscles.

The streptococci may be seen in the Haversian canals and canaliculi and may also be cultured from the bony scrapings.

Autopsy findings on certain rabbits show exudate in the serous sacs with occasional involvement of the peritoneum, pericardium and pleura. There may be a generalized oedema-like denseness of the skeletal musculature and



Fig. 3.—Rabbit No. 9. Acute exudative productive lesion of the right elbow joint.

subcutaneous tissues, possibly due to salt imbalance and kidney involvement. The joints involved show exudation, with some capsular thickening. The muscle fibres frequently show small hemorrhages probably akin to myalgic nodules in the human. There may be pathology of the heart, liver and kidneys. Scrapings of the joint surfaces on culture give organisms identical with the ones injected.



Fig. 4.—Rabbit 6. Acute exudative atrophic wrist joint. Atrophic changes very marked around the epiphysial cartilages.

These streptococci on injection produce septicaemia, indolent joint symptoms similar to those found in the human, muscle weakness and sometimes diarrhoea and corneal opacities similar to iritis. They can be recovered from the autopsied rabbit, reinjected into the vein of a normal one, and again produce a similar succession of symptoms with recovery of the same type of streptococcus at autopsy.

Having tested the uniformity of the blood culture strains in producing such symptoms in a series of twelve rabbits, we again decided to try the same experiment with individual focal strains. These focal strain inoculations were uniformly unsuccessful in producing anything but fatal septicaemias, definitely purulent joints or no symptoms



Fig. 5.—Rabbit No. 1. Generalized chronic atrophic deformans arthritis, upper extremity.

whatsoever until we used *faecalis* and *infrequens* strains isolated from stool cultures of chronic arthritides. Such cultures produced the same indolent joint pathology observed after the blood culture inoculations but the onset of the symptoms was slower.

We are somewhat at a loss to account for so frequently finding the *faecalis* and *infrequens* in both blood and stool cultures when the two organisms are so rarely found in foci of infection such as teeth and tonsils. The only reasonable explanation seems to be that the streptococcus is able to adapt its sugar fermenting properties to its environment, thus permitting a focal infection to give a secondary implant that adapts itself to growth under changed conditions in the intestinal tract, the joints and the blood stream itself.



Fig. 6. Rabbit No. 1. Generalized chronic atrophic deformans arthritis, knees and ankles

Correlating our findings it would seem to be a justifiable statement that evidence would inculcate both *infrequens* and *faccalis* streptococci as at least very important causative factors in the production of chronic arthritis in the human, probably with some deficiency element also present. As these organisms are found most frequently in the intestinal tract, we feel that the intestine is one of the major portals of entry in the arthritides.

A CLINICAL INDEX OF MALIGNANCY FOR
CARCINOMA OF THE BREAST *BURTON J. LEE and JOHN G. STUBENBORD
Memorial Hospital

Broder has classified cases of cancer, with respect to the degree of malignancy, into one of four groups, based upon the histology of the tumor. His work has stimulated many others to study groups of cases in a similar manner. Greenough recently published the results of such a study in a series of cases of mammary cancer and reached the conclusion that one could predict, with reasonable accuracy, the outcome of a case, depending solely on such an histological survey. The pathological laboratory of the Memorial Hospital has included for some years, as an integral part of its report of tissue study, a grading into one of three groups indicating the degree of malignancy of the process. It seemed to us that so much emphasis has been placed upon histological findings that we have lost sight of the importance of clinical data, always available for study. Reflection upon this subject has led us to believe that cases of carcinoma of the breast may be graded from purely clinical data and furnish perhaps an even more accurate estimate of the degree of malignancy, than the histology of the tumors can reveal.

A wide variation is found in the clinical setting and course of mammary cancer, for the disease may be fatal in a few months or continue for many years, in our own experience the shortest duration being 5 months, and the longest 22½ years. A marked difference in malignancy exists between tumors of small size which have been present for years, compared to those of rapid growth, present but a few weeks or months. A more favorable prognosis should be expected when the disease is thoroughly local-

* Delivered before the Section of Surgery, November 2, 1928.

ized, as compared to the outlook when the axillary lymph nodes are extensively involved. Cancer of the breast associated with pregnancy or lactation, presents a menacing picture and usually runs a rapidly fatal course. An elderly woman, with a well-localized process, which has shown little growth activity, would be placed in the relatively benign group. A rapidly growing tumor in a young woman would be classified as highly malignant. Upon the other hand, a well encapsulated tumor of considerable size, even with beginning ulceration, but without involvement of axillary nodes is often of relatively low malignancy. All of these considerations should be taken into account, prior to treatment, in evaluating the degree of malignancy. Such an estimate of the patient's status based on clinical data, is important, for it may guide the surgeon in the matter of prognosis and determine his decision for or against operation.

Although there were many clinical factors which might be considered, it seemed to us that the four major ones to be used in estimating the degree of malignancy were:

- 1: Age.
- 2: Lactation present.
- 3: Rate of growth.
- 4: Extent of disease.

These are the weighting factors, and they alone have been considered in building up what we have chosen to call "*a clinical index of malignancy.*" After due consideration, the weight which we assigned, arbitrarily, to each factor was as follows:

Age	—	A = 2
Lactation	—	L = 3
Rate of growth	—	R = 4
Extent of disease	—	E = 5

Each weighting factor was sub-divided into "Gradation Factors," in a similar manner and the following arbitrary values were assigned to each:

TABLE NO. 1 *

	Weighting Factor	Gradation Factors
Age	A = 2	Ag { Over 55 = 1 41 — 55 = 2 40 or under = 3
Lactation	L = 3	Lg { Absent = 0 Present = 3
Rate of growth	R = 4	Rg { Slow = 1 Moderate = 2 Rapid = 4
Extent of disease	E = 5	Eg { Small 3 cm. or less = 1 Large = 2 Nodes present = 4

* We desire to express our thanks to Dr. Raymond Pearl, of the School of Hygiene, Johns Hopkins University, for his guidance and aid in the development of the index.

The clinical index of malignancy for any individual patient is calculated by multiplying the value of each weighting factor by its gradation factor and adding the four results. The formula for the index is as follows:

$$C.I.M. = 2 \text{ Ag} + 3 \text{ Lg} + 4 \text{ Rg} + 5 \text{ Eg}$$

An inspection of Table No. 1 reveals that the smallest possible clinical index is 11:

$$C.I.M. = (2 \times 1) + (3 \times 0) + (4 \times 1) + (5 \times 1) = 11$$

The highest possible figure which may be obtained is 55:

$$C.I.M. = (2 \times 5) + (3 \times 3) + (4 \times 4) + (5 \times 4) = 55$$

Based upon such a calculation, patients may be placed in one of the three following grades:

- Grade A. — 11 — 25 — Relatively benign.
- Grade B. — 26 — 39 — Moderately malignant.
- Grade C. — 40 — 55 — Highly malignant.

In order to determine the soundness of such an index as a guide to ultimate prognosis, we have surveyed 100 primary operable patients from the breast clinic without any attempt at selection. All of these patients were treated surgically with the addition of pre-operative and post-operative X-radiation.

Following are the gradings according to the clinical index of malignancy and the ultimate outcome:

TABLE NO. 2—CLINICAL GRADING

Grade A — Relatively Benign — 26 Patients			
Alive and well	5 years or more	18	— 69%
Dead within	1 year	0	
“ “	2 years	2	
“ “	3 years	3	
“ “	4 years	2	
“ “	5 years	1	
Grade B — Moderately Malignant — 51 Patients			
Alive and well	5 years or more	18	— 31%
Dead within	1 year	11	
“ “	2 years	10	
“ “	3 years	6	
“ “	4 years	3	
“ “	5 years	3	
Grade C — Highly Malignant — 23 Patients			
Alive and well	5 years or more	1	— 4%
Dead within	1 year	12	
“ “	2 years	6	
“ “	3 years	2	
“ “	4 years	0	
“ “	5 years	1	

It is apparent that a reasonably accurate prognosis can be given by the use of the clinical index, Grade A showing 69 per cent alive and well, 5 years or more after operation, compared with 34 per cent in Grade B, while in Grade C, but 1 patient, or 4 per cent, was without evidence of disease at the end of 5 years.

None of the patients graded "A" died within the first year, and but 2, or 9 per cent, within the first two years. A large number of the cases in Grade B succumbed to the disease in the first two years, 22 per cent dying in the first and 41 per cent within the two year period. Of the patients graded "C," more than one-half died within the first year and within the first two years 78 per cent had succumbed.

In order to determine whether the clinical or histological grading would furnish a more accurate prognosis, Dr. James Ewing has graded the same 100 cases, based solely upon histological study. He has placed them in one of three grades according to the degree of malignancy.

Following are the histological gradings:

TABLE NO. 3—HISTOLOGICAL GRADING

Grade I — Relatively Benign — 23 Patients			
Alive and well	5 years or more	12	— 52%
Dead within	1 year	1	
" "	2 years	4	
" "	3 years	5	
" "	4 years	0	
" "	5 years	1	
Grade II — Moderately Malignant — 63 Patients			
Alive and well	5 years or more	21	— 33%
Dead within	1 year	18	
" "	2 years	11	
" "	3 years	6	
" "	4 years	4	
" "	5 years	3	
III — Highly Malignant — 14 Patients			
Alive and well	5 years or more	4	— 29%
Dead within	1 year	4	
" "	2 years	3	
" "	3 years	0	
" "	4 years	1	
" "	5 years	2	

A study of Table No. 3 reveals that in the relatively benign group, 52 per cent of the patients were without evidence of disease five years or more after operation; whereas, by the clinical grading, 69 per cent of these more favorable patients were alive and well at the end of this period. In Grade II, 33 per cent survived five years, free from disease, a figure closely comparable to the 34 per cent obtained by the clinical grading. In Grade III, the histological grading showed 29 per cent alive and well at the end of five years compared to 4 per cent by the clinical grading. It is obvious that the histological grading fails to place a sufficient number of the more favorable cases in Grade I. Furthermore, it does not draw a sharp distinction between Grades II and III, for the figures for these two grades, for satisfactory five year results, are too closely comparable: Grade II—34 per cent, Grade III—29 per cent. A much wider divergence should appear to have the gradings of any significance.

In Grade I (histological) 4 per cent died within the first year compared to 0 per cent for those graded clinically, and within the first two years 22 per cent succumbed to the disease in comparison to 9 per cent for those in clinical Grade A. In Grade II (histological) 29 per cent died within the first year compared to 22 per cent of the clinically graded cases. Within the first two years 46 per cent succumbed to the disease, while 41 per cent of the patients, graded clinically died. In Grade III. 29 per cent died within the first year and 50 per cent within the first two years, in comparison to 50 per cent and 78 per cent for the clinically graded patients.

The following table matches up the five year results in 100 cases, and indicates how the patients in each clinical grade were graded histologically:

TABLE NO. 4—COMPARATIVE CLINICAL AND HISTOLOGICAL GRADINGS

CLINICAL GRADING		HISTOLOGICAL GRADING					
		Alive and well	1 year	2 years	3 years	4 years	5 years
Grade A		Grade I	6		1	2	
Alive and well	18						
Dead within 1 year	0						
" " 2 years	2						
" " 3 "	3						
" " 4 "	2	Grade II	10		1	2	1
" " 5+ "	1						
Grade B		Grade III	2		1		
Alive and well	18						
Dead within 1 year	11						
" " 2 years	10						
" " 3 "	6						
" " 4 "	3	Grade I	6	1	2	2	1
" " 5+ "	3						
Grade C		Grade II	10	9	6	4	2
Alive and well	1						
Dead within 1 year	12						
" " 2 years	6						
" " 3 "	2						
" " 4 "	0	Grade III	2	1	2		1
" " 5+ "	2						
Grade C		Grade I			1	1	
Alive and well	1						
Dead within 1 year	12						
" " 2 years	6						
" " 3 "	2						
" " 4 "	0	Grade II	1	9	5	1	1
" " 5+ "	2						
Grade C		Grade III		3			
Alive and well	1						
Dead within 1 year	12						
" " 2 years	6						
" " 3 "	2						

Inspection of Table No. 4 reveals several facts of considerable interest. In the relatively benign group (clinical) 10 of the patients, remaining alive and well, were placed in Grade II on a histological basis. It is evident that these patients should have fallen into the relatively benign rather than the moderately malignant group. Of the patients in Grade B (clinical) two of those remaining alive and well were considered Grade C cases, when the histological grading was followed. Of the highly malignant group, according to clinical grading, 9 of the patients who succumbed to the disease within one year,

were classified Grade II cases on a histological basis. It seems fair to conclude that the clinical grading made a more accurate selection of the patients than did the histological.

One reason for the failure of histological grading to provide a correct prognosis lies in the fact that different histological pictures, indicating varying degrees of malignancy, may be found in various portions of the same tumor. The study of a small section may reveal one type of histology where another section may show a much more malignant type of tumor growth. The study of large sections initiated by Sir George Lenthal-Cheatle, and first used in this country by Mr. Ellis, of the Laboratory force at Memorial Hospital, demonstrates the marked variation in histological pictures in different portions of the same tumor, and shows the difficulty of histological grading for any individual patient.

Moreover, histological grading fails to provide a correct prognosis because no consideration is given to those important clinical factors, which determine the ultimate outcome of the disease.

From this study, no doubt can exist that the histological grading is far less effective in furnishing an accurate prognosis than the clinical grading permits. We are firmly convinced that the grading of patients based upon the Clinical Index, gives a more accurate estimate of the type of disease and the ultimate prognosis than any other grading hitherto proposed.

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RESOLUTIONS PASSED AT THE STATED MEETING OF FEBRUARY 7, 1929

The Council appointed an Advisory Committee to each of the Sections in the Spring of 1928. A meeting of the Section officers was held subsequently at which Section matters were discussed. A special committee of the Council was appointed to consider certain suggestions and draft a proposed change in the By-Laws. This draft was approved by the Council and submitted to the Section officers, and has received their approval. It was referred to the Academy with the recommendation of the Council that it be adopted:

RESOLVED 1. That Section 4 of Article XVI be amended to read as follows:

At the March meeting the Chairman of each Section shall appoint a Nominating Committee of three Fellows of the Academy. This Committee shall present nominations for Chairman, for Secretary and for a member of the Advisory Committee at the April meeting. After the report of the Nominating Committee has been received other nominations may be made by any Fellow entitled to vote. These nominations shall be printed on the Academy folder and on the special announcements of the Section for the May meeting. At the May meeting the elections shall be by ballot and no Fellow who is not regularly assigned to the Section, or who is under suspension shall be entitled to vote or be eligible to office. The Secretary of each Section shall promptly notify the Recording Secretary of the Academy of the result of the election.

RESOLVED 2. That a new Section to be numbered 5 of Article XVI read as follows:

Each Section shall elect an Advisory Committee of five Fellows each of whom shall have been a Fellow for at least five years. The Advisory Committee shall advise the officers of the Section on all matters relating to the scientific work of the Section and on any other matters referred to it by the Section or its officers. The members of this Committee shall each serve for five years, one retiring and one being elected each year as provided in Section 4 of Article XVI. Vacancies may be filled at any meeting during the year, nominations and elections being made in the same manner as at the annual election.

3. The present Section 5 to be numbered 6.

4. The " " 6 " " 7.

5. The " " 7 " " 8.

6. The " " 8 " " 9.

7. The " " 9 " " 10.

PUBLIC HEALTH RELATIONS COMMITTEE REPORT ON OPEN HOSPITALS IN NEW YORK CITY

The term hospital is used in this report to designate those tax-free institutions, supported by philanthropic contributions or by the city, county or state, which are used for the care of the sick, or injured. The numerous proprietary institutions, owned by an individual or group of individuals, and conducted for a financial profit are not considered in connection with the subject matter of this report.

An open hospital, in the broadest sense of the term, is one to which any physician, legally qualified to practice medicine, may send his patients, either to separate rooms or public wards, and there carry out any measures of diagnosis and therapy he considers desirable. In New York City procedures of a surgical nature may be carried out in such a hospital only by practitioners who possess the experience necessary for surgical work.

The argument for the open hospital is based on the following considerations:

1. Hospital experience affords opportunity for general and practical professional education not otherwise available. It brings about a raising of the level of professional ability of practicing physicians.

2. In the case of a charity patient the physician has the educational advantage of following through the course of the disease; in the case of the pay patient in addition to this, his professional and financial relations with the patient, begun outside of the hospital, continue after the patient's admission. In either case, continued attendance prevents a loss of professional prestige.

3. A patient sent to an open hospital receives such benefits as the hospital has to offer, and in addition remains

¹ On Dec. 26, 1928, the Council approved the publication of this report in the Bulletin.

under the care of a physician of his own selection, who maintains a personal interest in and responsibility for his welfare. This is to the general advantage of the patient. It results also in a better state of mind on the part of the patient.

4. Hospitals are public institutions in so far as they are tax-free and supported by the public. Their advantages should therefore be available to any member of the community and to all reputable physicians legally authorized to practice in the community.

5. The administration of an open hospital presents no insurmountable difficulty.

In brief, it is claimed that the open hospital offers educational advantages to the profession at large; that it protects the prestige and improves the financial status of the physician, and that it contributes to the welfare of the patient. It is from these standpoints that the Committee has studied the problem.

The discussion of the problem in its practical aspects in New York City calls for consideration of the pertinent facts in the situation.

The capacity of the tax-free hospitals in Greater New York is approximately 33,500 beds. This number includes beds in hospitals for chronic diseases but does not comprise the existing facilities in state or federal hospitals located within the city limits.

Sixty per cent of the beds are in hospitals maintained by private corporations and forty per cent in municipal hospitals. Approximately two-fifths of the beds are in special hospitals; this includes Sea View and other tuberculosis hospitals as well as those devoted to orthopedics, gynecology and obstetrics, oto-laryngology, ophthalmology, dermatology, neurology, cancer and contagious diseases.

In considering hospital opportunities for physicians in New York City, it should be borne in mind that the character of the work in the special hospitals requires pre-

liminary hospital training of a specialized character, and also that two-thirds of the service in general hospitals is of a surgical character. The total number of beds in the hospitals of New York devoted to the general run of medical cases does not exceed 6,400 to 6,500.

At the present time, the hospitals in New York City are scattered over a wide area and some are located at considerable distances from the principal population centers and are not easily available to physicians, except those residing in the neighborhood. Furthermore, only about ten per cent of the total bed capacity of the private hospitals is in single rooms and about fifteen per cent in the so-called semi-private rooms. The opportunities for private pay cases in the hospitals in New York City are therefore limited to but one-fourth of the 19,000 beds of the private hospitals. This constitutes but about seven per cent of the total bed capacity.

There are in New York City 10,877 physicians. Of this number five per cent are over sixty years of age, and about eight per cent are employed, on a full or part time basis, in the city service. The first group is close to the period of retirement from active work in the hospitals, and in the latter group there are not very many who have the time to give to active hospital work. There is probably at least another two per cent of physicians who are in executive positions in industrial, commercial, insurance and scientific corporations and who devote their entire time to these associations. Eliminating men on the hospital consulting staffs, over 39 per cent of the registered physicians in the City have hospital appointments. Some of these positions carry likewise responsibilities in the out-patient departments. In addition to those who have both hospital and out-patient affiliations, 11.5 per cent of the licensed physicians have dispensary services, thus making a total of almost 51 per cent having institutional affiliations.

Considering that 15 per cent of the physicians are either past the active period of their practice or are engaged in

public health, industrial or executive work, the percentage of those who are without institutional appointments resolves itself to approximately 34 per cent of the total. Many of these have, however, courtesy privileges in hospitals. In this connection the physical possibilities of hospital affiliations must be considered. At the present time in New York City there is one physician to approximately every 550 inhabitants, and the ratio of physicians to hospital beds is 1 to 3. The proportion of physicians to hospital affiliations in New York is greater than in many other large American cities, and much greater than in European communities. This showing is the more remarkable in view of the large number of physicians who have more than one hospital affiliation. The following table indicates the multiple affiliations of the four principal groups—physicians, surgeons, specialists and laboratory men. It will be seen from this table that the multiple connections occur most frequently in the case of laboratory men and surgeons, and least frequently among physicians; the specialists occupy the midground.

NUMBER OF AFFILIATIONS
(Excluding consultants)

	1	2	3	4 or more	Total
	%	%	%	%	%
Physicians	72.0	20.9	5.0	2.1	100
Surgeons	55.3	28.6	12.0	4.1	100
Specialists	62.7	25.2	8.3	3.8	100
Laboratory Men	53.1	23.5	10.2	13.2	100

Many of the multiple connections are explainable in view of the fact that 40 per cent of our hospital beds are in municipal hospitals which do not have private or semi-private facilities. The physicians and surgeons affiliated with these institutions seek other connections to do their private work. Aside from this, the multiple connections could and should be curtailed.

As hospital organization has developed, the long term continuous service, usually annual, has superseded the shorter rotating services and this has, in many instances

increased the number of opportunities of hospital affiliation because of the junior appointments. An analysis of the average number of ward beds per physician in the hospitals of this City leads to the conclusion that some hospitals have not absorbed a maximum number of men. Judging by averages, some hospitals like the N. Y. Post-Graduate, Polyclinic, Jewish of Brooklyn and the Beth David are overstaffed, while in St. Francis, the Roosevelt and the Woman's Hospital the ratio of the attending staff is below the average. It is of interest, as pointing to a desirable norm, that in such hospitals as the Presbyterian, New York, St. Luke's, Mount Sinai, Lenox Hill and the Methodist Episcopal of Brooklyn, the ratio of attending staff to ward beds is approximately 1 to 5.

A study of hospital affiliations by years in practice indicates that large groups of the attendings are in the younger age groups; only 26 per cent of the total number of attendings have been in practice over 25 years and less than 20 per cent from 21 to 25 years. The following table indicates the proportions of physicians, surgeons, specialists and laboratory men in hospital work, subdivided by quinquennia in practice.

YEARS IN PRACTICE AND HOSPITAL AFFILIATION

Physicians		Surgeons	Specialists	Lab. Men	Grand
Yrs. Out	%				Total
1 - 5	13.3	5.6	5.7	2.	7.8
6 - 10	19.2	20.2	17.7	21.4	19.1
11 - 15	15.7	14.5	19.1	11.2	16.9
16 - 20	12.9	18.2	16.	22.5	15.4
21 - 25	13.	14.1	16.1	18.4	14.8
over 25	25.9	27.4	25.4	24.5	26.
Total	100	100	100	100	100

As would be expected, the proportion of the younger attendings in surgery and the specialties is smaller than in general medicine.

From an ideal community viewpoint every duly licensed practitioner should have opportunity for hospital affiliation. This, however, is impossible of realization in New York City at the present time, as the above statistical facts indicate. Constructive statesmanship calls for the best possible utilization of the existing opportunities from the standpoints of the welfare of the patient, economic advantages, and the educational opportunities for the physician.

Opportunities for graduate education in New York have increased greatly in recent years. In the medical sciences the Society of Experimental Biology and Medicine, the New York Pathological Society and the Harvey Society offer instructive programs. Any physician qualified to do so may carry on research work in a subject in which he is interested in the laboratories of the local medical colleges and of those of many of the hospitals. The Kings County Medical Society and the New York Academy of Medicine give series of practical lectures. The programs of the Academy Sections commonly include presentation of cases. The Committee on Medical Education of the Academy publishes lists of hospital and dispensary clinics which cover practically the entire field of medicine. Graduate courses covering a wide range of subjects are offered by certain hospitals and medical schools. At one of the medical schools there is a graded graduate course in surgery, leading to a hospital and dispensary clinical medical school dispensaries, which include all branches of medicine, surgery and the specialties, afford opportunity for the study of methods of diagnosis and treatment, better in many instances than that given by hospitals. Any physician sufficiently ambitious can keep abreast of the advances in his subject. It is a matter of regret that a large number fail to do so. The clinics so extensively advertised are not well attended. The dispensary staffs are generally below their quota. Many graduate courses announced are not given because of the small number of applicants.

OPEN HOSPITALS

From what has been stated, this Committee feels warranted in believing that the medical profession in general is not making full use of the educational advantages at present available. Under such circumstances it might well be asked whether a demand for additional educational opportunities is sincere. That the open hospital offers striking educational opportunities has been assumed by those who favor it. The Committee is not convinced, however, that this is true to any appreciable extent. In the open hospital plan a physician sending his patient to the hospital carries out his own idea of treatment in a way not differing from that in his outside practice. There is no check or supervision of the procedures he employs, there is no one whose duty it is to serve as a teacher. In the open hospital the physician has no privileges as regards examination or study of hospital patients other than his own. Hospital rounds, discussion of cases, staff meetings, will in all probability not be carried out to any degree, however valuable these may be in principle, and however much they may be listed as available assets in a plan for open hospitals. It is true that diagnostic procedures may be more easily carried out, and therapeutic measures employed which require less personal effort on the part of the physician, but the advantage, speaking generally, is one not of education but of convenience, prestige, and profit.

That the prestige and financial status of a physician who has hospital privileges are improved is readily understandable. The abrupt termination of the professional relations between conscientious physician and his patient which occurs when the latter is sent to a hospital is an injustice to the physician. The remedy does not lie, however, in the open hospital. This matter will be referred to later in the suggestions made by the Committee.

The welfare of the patient is a matter of the first importance. A patient is sent to a hospital for the purpose of making diagnostic procedures more readily available, or of securing better medical treatment for his illness.

In regard to the first of these two reasons, the open hospital offers no advantages over the present system. In regard to the opportunity for better treatment, the matter is at least debatable. No system involving group coöperation may be considered perfect in practice. It is common knowledge that one hospital differs from another in general and specialized efficiency just as, for example, one surgeon differs from another in diagnostic ability and operative skill. A low ranking of one hospital does not condemn the system. There is no doubt that many of the group of unattached physicians are as competent as the members of hospital staffs but, looking at the matter from a broad standpoint, the Committee believes that the physicians attached to well organized hospitals are better prepared by experience and training to diagnose and treat disease than are those not attached. The hospital physicians are to be considered as specialists in their respective lines. The hospitals in which undergraduate teaching is done represent the best type under the present system. The members of the attending staff have had as a rule a thorough dispensary apprenticeship, and, in general, have been selected because of special fitness. There are graded positions with a definite responsibility attached to each, leading up to that of the director, who is responsible for the entire service. Appointments, tenure of office, and promotions are based on the excellence of the work done. There is no question that ward patients in such hospitals receive expert medical diagnosis and treatment. A close coöperation between the various divisions adds further to this. In addition to the advantages offered the patient, such hospitals serve another and perhaps equally important purpose. Through the careful study of disease they make possible the advances in medical knowledge which are for the good of all. While there is no doubt that many hospitals fall far below the type described, they are all striving for improvement, and the standards are constantly rising.

In regard to the problem of administration of the open hospital, the opinions of a number of hospital executives

OPEN HOSPITALS

have been obtained. All agree that the open hospital makes the task of administration very difficult. It creates confusion in the nursing system, in the training and supervision of the intern staff and in the matter of record keeping. As a result hospital discipline suffers and the effectiveness of the hospital falls below the prevailing standard of the ordinary hospital. Great advantages from other standpoints must be assured to offset the disadvantages that would arise from the change in the present administrative system in New York hospitals. The conditions of hospital organization which obtain in other sections of the country and in the small communities of the East are different from those prevailing in New York City where a large and diverse population creates problems that are existent nowhere else. A single hospital in a small community has a disciplinary and social control of its doctors by reason of the relative smallness and compactness of the community that cannot possibly be obtained in the metropolitan area of New York City.

Appreciating the advantages of clinical experience and study, the Committee suggests that dispensaries can be made much more useful for younger men. With an experienced teacher as head of each dispensary division with a rotating service for the younger men, whereby each is assigned for a suitable time to each of the divisions with a sufficient number of physicians in attendance to allow of thorough work on patients, with staff discussions and consultations—the advantages of the dispensary for general post-graduate education are unequalled. Furthermore, it is not a difficult matter to arrange a close connection between dispensary and hospital. One of such plans is hereby presented as illustrating a method of close tie-up between the hospital and the dispensary. Let each physician entering out-patient service understand that he is expected to devote eight years to dispensary work; this time to be divided into four periods, each of two years' duration. During the first two periods his work is to be limited to the out-patient department exclusively; during the second two terms his time will be divided between the

hospital and the dispensary. As he enters upon the third term of his service in the out-patient department, he simultaneously begins his first term in the hospital as an assistant visiting physician of the lowest rank. In two years he becomes the chief of the out-patient clinic and graduates to the next highest rank in the hospital. After eight years of service during four of which he held rank on the visiting staff of the hospital, he may step out, enriched by the valuable association with the hospital and by the experience gained in supervised team work, or if he has demonstrated his ability he becomes eligible for appointment on the permanent staff.

Such a plan, with modifications to suit various situations, would enable a larger number of men to form hospital connections than is now feasible; would render dispensary work more worth-while and sought for; would link the out-patient department more closely with the hospital, with resultant benefit to the patients and the community and would raise the general standard of medical practice in the community. Energetic efforts to develop to the full the post-graduate opportunities of the dispensary should be made. The physicians, however, must show that they are willing to work to make the efforts worth-while.

As has been stated above, the number of physicians attached to hospital staffs can be increased with advantage to the hospital. As pointed out earlier in the report, the proportion of physicians to ward beds varies from 1 to 1 to 1 to 11. A proportion of 1 to 5 is considered a workable one. Such a proportion is conducive to concentration of effort on a small group of patients, and hence affords more opportunity for the study and care of each patient.

The courtesy privileges afforded by certain hospitals may be made more general. The hospital should insist, however, that those who apply for courtesy privileges should prove that they possess the necessary qualifications. Opportunity should be given to the members of the cour-

tesy staffs to study other patients, and to take part in ward rounds and staff discussions.

Physicians sending patients to hospitals should be considered as being in consultation on their cases and not as is sometimes the case as intruders when they come to the hospital. There is no reason why these physicians should not receive remuneration in return for any service rendered while the patient is in the hospital.

There is room for a very considerable number of volunteer workers in many of the New York hospitals. In the plan the Committee presents herewith for consideration, a physician desiring hospital experience, will apply to the director of the service desired. He will be required to spend daily in the hospital at least the same amount of time as is required of members of the staff. The director will assign him work to do, the nature of which will depend on the physician's training. In time, and this will vary with the individual, he will have the necessary qualifications for appointment to the staff of a hospital. Possession of those qualifications should afford courtesy privileges in the hospital in which he is working and in others as well. The number of volunteer workers who could be taken into the numerous hospitals of New York is a considerable one. A single large general hospital might easily accommodate fifty men or more. Each hospital taking part in the plan would serve as a graduate school, and much could be accomplished not only in this direction but also in a closer study of the patients themselves. The success of any such plan as this would depend largely on the enthusiasm of the director and his staff and their willingness to serve as supervisors and teachers of the volunteer workers.

SUMMARY

1. Of the larger cities, New York provides physicians with the greatest opportunities for hospital affiliation. In practically all instances, a physician with ambition, industry, honesty of purpose and ability to coöperate with

others can secure a position in a good hospital if he is willing to serve the necessary apprenticeship.

2. Through the gradual education of the public, there has come a general appreciation of the facilities offered by the hospital for diagnosis and treatment. Progress in clinical medicine has come about mainly through the hospital. Because of its trained staff, the work in the closed hospital is carried out more efficiently than in the open hospital, and the patient is better served in a closed hospital than in an open one. The present system contributes to the advancement of medical knowledge and welfare of the individual patient.

3. The opportunities for professional education offered by a hospital affiliation are obvious. The failure on the part of so many physicians to take advantage of existing educational opportunities throws doubt on the argument that the open hospital will bring about an appreciable improvement in professional attainment. The hospital connection in itself means little, if anything, in this connection. It is the opportunities that go with it that are important. Since available facilities for professional improvement are so little utilized, the claim that those offered by the open hospital will be so used, carries no conviction. The sincerity of the demand for open hospitals on a basis of opportunity for research and education may be questioned.

4. There is place for certain improvements in the details of hospital organization.

5. While some hospitals may seem to be overstaffed, others can add to their attending staffs without interfering with the present efficiency of their work. A ratio of one member of attending staff to every five ward beds prevails in many of the best organized hospitals.

6. A large proportion of our hospital facilities are in the municipal hospitals to which no private patients are admitted. Those who attend the non-pay patients in the municipal hospitals seek other appointments in voluntary

hospitals where they can carry on their private work. From the community point of view and that of medical efficiency, overlapping multiple appointments are unnecessary and undesirable, except one appointment in a private hospital in addition to service in a municipal hospital.

7. The union between the out-patient department and the hospitals is not as close in many institutions as it should be for the benefit of the patients as well as for educational opportunities and advancement of the profession.

8. Insofar as New York City is concerned, the open hospital plan is unnecessary, undesirable and impractical at the present time. All that is claimed for the open hospital can be obtained equally well and much more simply by modifications of the present system.

RECOMMENDATIONS

1. All hospitals which are not fully manned should be urged to increase their staffs to a point compatible with greatest efficiency.

2. In principle, no member of the attending staff should have more than one active hospital appointment, with the exception of those who serve on the visiting staffs of municipal hospitals where no private patients can be accommodated.

3. When a patient is sent to a hospital by a physician not on that hospital staff, every effort should be made by the hospital authorities to continue the contact between the patient and the physician who referred the patient. In cases of patients occupying private or semi-private accommodations in the hospitals, the family physician making professional visits may with propriety charge for his services.

4. Courtesy privileges granted by hospitals should be made available to the greatest possible number of physicians who have proven themselves properl

5. The plan of making places in hospitals for volunteer physicians should be seriously considered and adopted wherever possible.

6. The dispensary or the out-patient department should be more developed as a place for graduate teaching and it should be integrated with the work of the hospital along the lines laid down in the body of the report.

COMMITTEE ON MEDICAL EDUCATION

SECOND ANNUAL GRADUATE FORTNIGHT

The Academy is making arrangements for a second series of lectures at the Academy, coördinated clinics, clinical demonstrations and courses in hospitals and teaching institutions of New York, on the subject of "Functional and Nervous Problems in Medicine and Surgery." The Fortnight will be held during the period October 7th to 19th, 1929.

It is believed that this year's subject will attract not only the medical profession generally but also social workers and those especially interested in public welfare. The field includes those functional disturbances which have been much neglected in the last thirty years in comparison with the structural disturbances of the human body.

Evening sessions will be held at the Academy at which well known authorities will discuss many phases of the general subject. During the mornings and afternoons specially prepared clinical programs will be presented in a number of the leading hospitals of the city. It is planned to present a full day's clinical program in each hospital co-operating in the Fortnight. Among the special subjects which will be considered in the lectures and clinical program are:

Sleep and insomnia	Post-operative neuroses
Headache and migraine	The psychoneuroses
Endocrines and the vegetative system	The cardiac neuroses
The involuntary nervous system	The digestive neuroses
General survey of visceral neuroses	The vascular neuroses
Metabolism and the vegetative nervous system	Shock
Allergy and the nervous system	Psychotherapy
The surgery of the vegetative system	Hysteria
Traumatic neuroses	Mental hygiene in connection with general practice
	Habit and conduct problems

The profession is generally invited to attend. No fee will be charged for attendance at any of the meetings or clinics on the program.

RECENT ACCESSIONS TO THE LIBRARY

- Avery, E.; Dorsey, J. & Sickels, V. A. First principles of speech training.
N. Y., Appleton, 1928, 518 p.
- Baumgärtner, K. H. Kranken-Physiognomik. Neuausgabe.
Berlin, Madaus, 1928, 222 p.
- Bower, A. G. & Pilant, E. B. Communicable diseases, for nurses and mothers.
Phil., Saunders, 1929, 327 p.
- Bucky, G. Grenzstrahl-Therapie.
Leipzig, Hirzel, 1928, 153 p.
- Castellani, A. Fungi and fungous diseases.
Chic., Amer. Med. Assoc., [1928], 203 p.
- Chandler, F. G. & Wood, W. B. Lipiodol in the diagnosis of thoracic disease.
London, Milford, 1928, 133 p.
- Charlin C., C.; Lobo-Onell, C. & Barrenechea A., S. La retinitis albuminúrica.
Barcelona, Salvat, 1928, 128 p.
- Chesser, (Mrs.) E. M. S. Child health and character.
N. Y., Oxford Univ. pr., 1927, 204 p.
- Collins, J. The doctor looks at marriage and medicine.
Garden City, Doubleday, 1928, 313 p.
- Cushing, H. W. Consecratio medici, and other papers.
Boston, Little, 1928, 276 p.
- Daudet, L. Mélancholia.
Paris, Grasset, [1928], 298 p.
- Dayton, H. Practice of medicine.
5. ed., Phil., Lea, 1928, 340 p.
- von Domarus, A. Einführung in die Hämatologie.
Leipzig, Thieme, 1929 [1928], 185 p.
- Ellis, R. S. The psychology of individual differences.
N. Y., Appleton, 1928, 533 p.
- Fisher, A. G. T. Chronic (non-tuberculous) arthritis.
London, Lewis, 1929, 232 p.
- Fürst, K. Grundriss der Arzneimittellehre für die Behandlung von Hautkrankheiten.
Leipzig, Thieme, 1928, 144 p.
- Garesché, E. F. The soul of the hospital.
Phil., Saunders, 1928, 207 p.
- Hatschek, E. The viscosity of liquids.
London, Bell, 1928, 239 p.
- Höber, R. Lehrbuch der Physiologie des Menschen.
4. Aufl., Berlin, Springer, 1928, 580 p.
- Hollingsworth, L. S. The psychology of the adolescent.
N. Y., Appleton, 1928, 227 p.

- Hübner, A. H. Die psychiatrisch-neurologische Begutachtung in der Lebensversicherungsmedizin.
Leipzig, Thieme, 1928, 170 p.
- Hurry, J. B. Imhotep.
2. ed., [London], Milford, 1928, 211 p.
- van Kerekhoff, J. H. P. Beiträge zur Kenntnis der Psoriasis vulgaris und ihrer Behandlung.
Leipzig, Hirzel, 1929, 273 p.
- Keyes, E. L. Urology.
N. Y., Appleton, 1928, 763 p.
- Klein, A. C. & Thorburn, G. Employment of the tuberculous.
[N. Y.], N. Y. Tuberculosis and Health Assoc., 1928, 71 p.
- Krause, A. K. Factors in the pathogenesis of tuberculosis.
Balt., 1928, 43 p.
- Lambourne, H. & Mitchell, J. A. Qualitative and volumetric analysis for medical students.
London, Milford, 1928, 64 p.
- Malloch, A. William Harvey.
N. Y., Hoeber, 1929, 103 p.
- Metzger, M. L'accoucheur moderne. Précis d'obstétrique.
Paris, Alcan, 1928, 602 p.
- Olson, L. M. Improved equipment in the home care of the sick.
Phil., Saunders, 1928, 109 p.
- Petty-Southwell (The) correspondence.
London, Constable, 1928, 343 p.
- Pirquet, C. & Wagner, R. Die Ernährung des Diabetikers.
Berlin, Urban, 1928, 191 p.
- Roqueta, G. La albuminuria en las enfermedades internas.
| Barcelona, Salvat, 1928, 365 p.
- Rowe, A. H. A handbook for the diabetic.
N. Y., Oxford Univ. pr., [1928], 129 p.
- Seashore, C. E. Psychology in daily life.
N. Y., Appleton, 1928, 225 p.
- Stewart, H. E. Physiotherapy, theory and clinical application.
2. ed., N. Y., Hoeber, 1929, 395 p.
- Taylor, R. A. Leonardo the Florentine. A study in personality.
New York, Harper, [1928], 580 p.
- Transactions of the Academy of conservative proctology. 1928. 5. Session.
[St. Augustine, 1928], 352 p.
- von Uexküll, J. Theoretische Biologie.
2. Aufl., Berlin, Springer, 1928, 253 p.
- Walker, K. M. & Walker, E. M. On being a father.
London, Cape, [1928], 192 p.
- Wolfers, F. Eléments de la physique des rayons X.
Paris, Hermann, 1928, 336 p.

PROCEEDINGS OF ACADEMY MEETINGS

JANUARY

ANNUAL MEETING

Thursday Evening, January 3, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Reading of the minutes

Election of Fellows

Address of Retiring President—THE ACADEMY AS AN EDUCATIONAL CENTER, Samuel W. Lambert

Address of Incoming President—THE ACADEMY, THE PROFESSION AND THE PUBLIC, John A. Hartwell

Reports of Council, Trustees, Treasurer, Committees and Sections

II. ADDRESS

A study of the streptococcus in the etiology of arthritis with demonstration of arthritic lesions experimentally produced, Reginald Burbank

Thursday Evening, January 17, at 8:30 o'clock

THE FOURTH HARVEY LECTURE

Urine formation as illustrated by an experimental nephritis, William deB. MacNider, Kenan Research Professor of Pharmacology, University of North Carolina

PETTON ROUS, President Harvey Society

PHILIP D. McMASTER, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for January

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILIS

Wednesday Evening, January 2, at 7:45 o'clock

Attention is called to the change in date and hour of meeting

ORDER

I. PRESENTATION OF PATIENTS

(a) Cases from the clinic of the University and Bellevue Hospital Medical College, Howard Fox, Edward R. Maloney, Walter J. Highman, Frank C. Combes, Jr., Leo Spiegel, Louis Tulipan, Harry C. Saunders, David Bloom, Rudolph Boenke, Paul E. Bechet, Eugene F. Traub

(b) Miscellaneous Cases

II. DISCUSSION

III. EXECUTIVE SESSION

SECTION OF SURGERY

Friday Evening, January 4, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- (a) 1. Birth constriction of the leg; simple operative repair
- 2. Abnormal relaxation of tissues of the face; plastic repair
- 3. Contracture of both axillae following burn; a method of skin transplantation
- 4. A case of hemolytic streptococcus gangrene of the upper extremity: Result after seven years, John H. Garlock
- 5. Chronic bone abscess of the phalanx
- (b) 1. Comminuted fracture of the elbow with closed reduction; one case
- 2. Demonstration of specimen; spindle cell sarcoma involving liver and stomach, Condict W. Cutler, Jr.
- (c) Malignant goitre; four cases, Edward W. Peterson
- (d) Two cases, Frank L. Meleney
- (e) Four cases, Arthur S. MacQuillan

III. PAPERS OF THE EVENING

- (a) The treatment of acute post operative thyroid toxemia, Arthur S. McQuillan
- (b) The importance of early diagnosis and early operation in hemolytic streptococcus gangrene, Frank L. Meleney

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, January 10, at 8:30 o'clock

ORDER

I. PAPER OF THE EVENING

The role of focal infections in the production of gastro-intestinal symptoms in infants and children

- a. Clinical aspects, McKim Marriott (by invitation)
- b. Chemical changes in the body, A. F. Hartmann (by invitation)

Discussion, Ruth C. Sullivan, Ph.D. (by invitation), Lynne A. Hoag (by invitation), Oscar M. Schloss, Charles H. Smith

Joint Meeting of the

SECTION OF OTOTOLOGY

and the

SECTION OF NEUROLOGY AND PSYCHIATRY

Friday Evening, January 11, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Diagnosis of brain abscess, Foster Kennedy
- b. Treatment of otological brain abscess, Harry P. Cahill, Boston
(by invitation)
- c. The neuro-surgical treatment of brain abscess, Joseph E. J. King
Discussion, Edward B. Dench

III. GENERAL DISCUSSION

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Friday Evening, January 11, at 8:30 o'clock

Kindly note change in date

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. The papyrus industry, with some remarks on the Edwin Smith papyrus, C. N. B. Camac
- b. Medicine in the study of the classics, Fred B. Lund, Boston
(by invitation)

III. EXECUTIVE SESSION

Regarding change of date of meetings

SECTION OF MEDICINE

Tuesday Evening, January 15, at 8:30 o'clock

ORDER

Program Presented by the Department of Medicine, Yale University

I. PAPERS OF THE EVENING

- a. Serum electrolytes in nephritic edema, J. P. Peters (by invitation)
- b. Serum proteins in malnutrition, F. S. Bruckman (by invitation)
- c. The production of edema and serum protein deficiency in rats by low protein diets, Robert A. Frisch (by invitation)
- d. Observations on nystagmus, James C. Fox, Jr. (by invitation)
- e. Pneumococcus Type III pneumonia, Francis G. Blake
(by invitation)

Discussion, Donald D. Van Slyke (by invitation), Russell L. Cecil

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, January 16, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. 1. Congenital polycystic nephritis—nephrectomy—specimen and patient

2. Echinococcus cysts of kidney—nephrectomy—specimen
Maurice Meltzer (by invitation)

- b. Multiple lithiasis of prostate—specimen, Victor C. Pedersen

III. PAPERS OF THE EVENING

- a. Renal compression, Joseph C. Ferrer, San Juan, Porto Rico
(by invitation)
Discussion by Edwin Beer
- b. Address, Colonel L. W. Harrison, Ministry of Health, Great
Britain (by invitation)
- c. Vesical rupture, Meredith F. Campbell
Discussion by Edward L. Keyes, A. Raymond Stevens

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, January 18, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Two interesting hand cases, Leo Mayer
- b. 1. Osteitis-fibrosa cystica with pathological fracture
2. Potts disease treated by multiple tibial grafts
3. Fracture of femur treated by sliding bonegraft, Charles Murray
Gratz (by invitation)
- c. Cases illustrating the paper of the evening, George Anopol
(by invitation)

III. PAPER OF THE EVENING

Extra-articular arthrodesis of the hip joint, Fred H. Albee

IV. DISCUSSION

SECTION OF OPHTHALMOLOGY

Monday Evening, January 21, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICAL CASES

- a. Complete paralysis external rectus, transplantation of vertical
rectitendons, Ben Witt Key
Discussion, James W. White, Conrad Berens, Ernest F. Krug,
Rudolf Aebli
- b. Report of a case of dermoid of the ethmoid sinus, with orbital
symptoms, James W. Babcock
Discussion, Arnold Knapp, Lewis W. Crigler
- c. 1. Report of a case of metastatic carcinoma of the ciliary body,
with subsequent history of the patient
2. Report of a case of cavernous angioma of the orbit causing
pressure symptoms on the eye ball, Arnold Knapp
Discussion, Martin Cohen

- d. 1. Case of traumatic pulsating exophthalmos
- 2. Case of haemangioma of the orbit, Martin Cohen
- e. Two cases of guttate keratitis, George W. Smith
Discussion, Arnold Knapp
- f. Case of tumor of the conjunctiva, Thomas H. Curtin
Discussion, Martin Cohen
- g. Case of mucous membrane graft from the mouth to the eye for
pannus, Ernest F. Krug

III. DEMONSTRATION

Fitting of artificial eyes with especial reference to gold ball implantation, Mr. Pierre Gougelmann (by invitation)
Discussion, Arnold Knapp

A new dissection scissors and a new needle holder constructed and shown by Samuel P. Oast

IV. PAPER OF THE EVENING

Transplantation of buccal mucous membrane with curative measure in eye diseases, Rudolf C. Denig

Discussion, Thomas H. Curtin, Ernest F. Krug, Arnold Knapp, Francis W. Shine, David H. Webster, Giovanni Paccione, Ernst Waldstein, Lewis W. Crigler

V. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, January 22, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Uterosalingography. With special reference to
 - (a) technic
 - (b) absence of untoward reaction
 - (c) therapeutic application

Lantern slide demonstration, Julius Jarcho

Discussion, Charles Gottlieb, Robert Lyness McCready (by invitation), I. C. Rubin
- b. Color motion pictures as an aid in teaching gynecology, Thomas H. Cherry
- c. The transverse lower segment incision in caesarean section, Frederick C. Irving (by invitation)
Discussion, Ralph Munson Beach (by invitation), Alfred C. Beck, Wilbur Ward

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, January 23, at 8:30 o'clock

Kindly note change of hour

New York Post-Graduate Hospital Night

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF PATIENTS
 - a. Bronchiogenetic cyst of larynx removed by thyrotomy.
C. J. Imperatori
Discussion, Louise H. Meeker (by invitation)
 - b. Dysphonia spastica, Leopold I. Glushak
 - c. Sarcoma of right ethmoid and antrum, radium implantation
 - d. Carcinoma of right ethmoid, antrum and sphenoid, radium implantation, Duncan Macpherson
 - e. Nasopharyngeal fibroma, radium implants, Simon L. Ruskin
(by invitation)
 - f. Large squamous cell carcinoma, external nose, radium implants
 - g. Rhinoscleroma, radium applications, G. Allen Robinson
 - h. Sarcoma of nose and pharynx, Alexander F. Laszlo (by invitation)
- III. REPORT OF CASES
 - a. Pituitary tumor (specimen), Alexander F. Laszlo (by invitation)
 - b. Carcinoma of tongue, radon seeds used
 - c. Carcinoma of larynx (2 cases) inoperable
 - d. Cardiospasm, child (Roentgenograms)
 - e. Stricture of oesophagus, congenital (?), Frank Richard Herriman
- IV. PAPER OF THE EVENING
Tumors of the nose and throat related to developmental defects,
Louise H. Meeker (by invitation)
Discussion, Ward J. MacNeal
- V. CINEMATOGRAPHIC PRESENTATION IN COLORS
Nasal disfigurement, J. Eastman Sheehan

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V.

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No. 3

THE SKIN AS A SHOCK TISSUE¹

ARTHUR F. COCA

(Delivered before The New York Academy of Medicine, December 6, 1928.²)

I have had to pay my respects to this word allergy on one or two occasions and I think I ought to explain that I did not myself select the term for the present program. As you know, Von Pirquet invented the term from the Greek words meaning altered re-activity and he intended it to cover increased re-activity and not lessened. Doerr took it up, applied strict etymology to it, and included under it conditions of lessened re-activity. Thus he placed with hypersensitiveness such conditions as immunity to diphtheria on the ground that it was specific and the tolerance to morphine of the morphine addict, which then made something of a little waste basket of the term; certainly it lost its real usefulness by this etymological extension. In this country the term of course does not include these two added conditions of lessened re-activity. No one thinks of immunity to diphtheria or the non-specific tolerance for morphine as allergic. In fact, some in this country would confine the use of the term to the human forms of hypersensitiveness while others would include also anaphylaxis. In view of this difference in the use of the term, Karsner and Ecker have said they preferred not to use it at all and I really cannot see how it can be scientifically used. The practical medical man,

¹ From the Department of Bacteriology and Immunology, Division of Immunology, in Cornell University Medical College, New York City, and the New York Hospital, New York City.

² Program presented in coöperation with the Section of Dermatology and Syphilis.

however, does use it and will continue to use it as the older physicians use the expression "torpid liver," without wishing to know what that might mean and certainly not caring.

In introducing the subject stated in the program, I should like to talk for some time on the subject of specific hypersensitiveness. Medical progress can not be made without classification. I might recall that we did not know anything about hay fever until we separated it from the common cold, and now more recently we have found that we could not learn much about hay fever until we separated it from anaphylaxis. And so, as a matter of fact, we have found the way to a clearer understanding of hypersensitiveness by distinguishing the five different forms that are shown on the chart. *Anaphylaxis* is an experimental condition of hypersensitiveness in lower animals, so far not found in human beings. The *hypersensitiveness of infection* of the tuberculin type, with which you are all familiar, occurs in animals or in man infected with tubercle bacilli or infected with *Bacillus mallei* and with spirochaetae and with other infectious organisms, which are particularly interesting to the dermatologist.

Atopy is a term covering the several inherited conditions of human sensitiveness. Those that are now well recognized in this class are asthma and hay fever and I think that from this evening's analysis we will be able to add to that with some certainty specific eczema. By specific eczema I mean eczema due to hypersensitiveness to some particular substance, usually a food substance and brought in contact with the skin after ingestion.

Dermatitis venenata is a condition well known to the dermatologist, affecting 60 per cent of human beings over five years of age that have been brought in sufficient contact with the excitant. In this country the most common excitant is poison ivy. Children under five years of age are not so much affected and certainly under three years they are only very rarely affected. *Serum disease* and *drug idiosyncrasy*, also acquired conditions, for the pres-

ent are included under the category of specific hypersensitivity, neither of them probably due to antibodies.

I should like to speak about the hereditary factor in atopy; i.e., on the question of how heredity governs the occurrence of asthma and hay fever and allied conditions. In the first place, I ought to remind you that these facts have been discovered largely through the researches of Dr. Robert A. Cooke and his co-workers, Dr. Vander Veer and Dr. Spain, and have been confirmed by Adkinson and more recently in a study of 1,000 cases by Ray M. Balyeat, who confirms the original findings of Cooke and his colleagues in every respect and has added an important point to be mentioned later. I should say also that the data as well as the conclusions of the studies of Cooke were submitted before publication to well known geneticists including Morgan, Davenport and Conklin, all of whom accepted the conclusions and considered it one of the best studies of the inheritance of pathological conditions in human beings.

The first way in which the influence of heredity is seen in hay fever and asthma is that where both antecedent lines are affected about 70 per cent of the children will be affected; this must be taken in contrast with the 7 per cent of the general population that are affected by these conditions. If the factor here is a Mendelian dominant we should expect 75 per cent of the offspring to show the condition. Secondly, if both lines are affected, the children are more likely to begin to show symptoms in early life (72 per cent by the age of 10 years) and all of those that are to be affected will show symptoms by the 35th year. Where only one antecedent line is affected the first symptoms may appear as late as at the age of 70. Thus we see that inheritance controls the age of onset of the condition, and since some of the individuals become sensitive to only one substance with which they come in daily contact it is necessary to conclude that the substance to which they are going to be sensitive is determined also by inheritance. The third way in which heredity influences

the occurrence of asthma and hay fever is that if the child is born in a family in which there is a pure hay fever lineage he is much more likely to be affected with hay fever than with asthma, and vice versa—a child of a pure asthma lineage is more likely to be affected with asthma than with hay fever. Finally Balyeat has found that a child subject to a bilateral hereditary influence will more likely show multiple sensitiveness; i.e., to several substances, than one subject to a lesser degree of hereditary influence.

If bronchial hay fever and asthma are subject so completely to heredity, what role does contact play in the establishment of this category of hypersensitiveness? It used to be thought that a person became sensitive to food because he had some anomaly of the gastro-intestinal tract allowing the passing of undigested protein through the mucous membrane into the blood where it acted as an antigen and sensitized the individual as an injected protein does the guinea-pig. Dr. Matthew Walzer, by a very ingenious method, has shown that in at least 90 per cent of people the normal gastro-intestinal tract is permeable to unaltered protein of various kinds, such as egg white, nut, fish, etc. Previous to that, Anderson and Schloss had shown that milk protein of the cow and egg white passed unaltered through the normal gastro-intestinal tract of children, because when they fed those two materials to babies they could often find antibodies (precipitins and anaphylactic antibodies) in the blood of those babies. Therefore throughout life unaltered foreign proteins are normally passing through the gastro-intestinal tract. Yet hypersensitiveness to these food proteins occurs only in those that are of an atopic lineage. Furthermore, asthma and hay fever are both often due, perhaps most often, to substances with which one comes in contact by inhalation. It was once thought that sensitization to these substances was due to an abrasion or some disease of the skin. It was noticed (and this may have been a basis for the belief) that children having eczema were likely later to develop asthma or hay fever. However, we see now that contact

plays only a secondary role in the etiology of these conditions. In the same sense we have to interpret the studies of Ratner and his associates on the passing of antigens through the placenta into the child from the mother. It would not seem to make any difference whether the antigen reached the child through the placenta of the mother or through its own gastro-intestinal tract or through its own respiratory tract. The route of its entrance into the individual certainly can have no special importance in the establishment of sensitization and once you have discovered the primary exclusive importance of inheritance in the establishment of hypersensitiveness, then any other consideration must take secondary place.

However, contact is probably necessary to the development of hypersensitiveness in a person that is born of atopic lineage. There are many people living in Europe who never come in contact with ragweed (which does not grow there but grows here), and who, if they came to this country, would become sensitive to the ragweed pollen. We know from studies here that about one-fourth of all subjects of hay fever sensitive to timothy pollen will be sensitive also to ragweed pollen. There are many cases of hay fever individuals sensitive to timothy pollen in Europe; one-fourth of these are potentially ragweed sensitive. Until they come in contact with ragweed pollen, the sensitiveness cannot develop. I would like to emphasize that not all forms of human hypersensitiveness are subject to inheritance; one can see this best by reference to the hypersensitiveness of the tuberculin type. Most individuals who become infected with the tubercle bacillus will develop this form of hypersensitiveness. Also dermatitis venenata, affecting 60 per cent of the population, cannot exclusively affect people of atopic lineage. In fact, we have tested a number of hay fever and asthma subjects with ivy extract and have found just as many of them insensitive to the extract as are found among non-atopic persons.

Having called attention to the importance of heredity in the establishment of atopy, we can now take up the

analysis of specific hypersensitiveness in general and especially compare anaphylaxis, which is experimental in animals, and atopy which is inherited in human beings.

There are two keys necessary to the understanding of specific hypersensitiveness. The first is the idea of the specific mechanism and the second is the idea of the shock tissue. In anaphylaxis the specific mechanism is the specific antibody, *i.e.*, anaphylactic antibody in the animal. These antibodies are produced actively by injecting the animal with a foreign protein, and their presence in the blood can be shown by injecting the serum into a normal animal, which almost at once becomes sensitive to the same substance that the original animal was sensitized to. This then is the specific mechanism in anaphylaxis; it is produced in lower animals and also in human beings. When produced in human beings it is not accompanied by clinical hypersensitiveness in the individual. This was first reported by Schloss. The shock tissue in the lower animals in anaphylaxis is unstriated muscle; anaphylactic antibodies from any animal, whether human being, dog, bird, or rabbit, are capable of sensitizing passively the unstriated muscle of the guinea-pig. The classical test object in the guinea-pig for the identification of the anaphylactic antibody is the uterine strip which is almost pure unstriated muscle.

In atopic hypersensitiveness, *i.e.*, asthma and hay fever, the specific mechanism is not the anaphylactic antibody; it is another sensitizing body, which differs characteristically in almost every respect from anaphylactic antibody, and which we called the *atopic* reagin. The atopic reagin can be demonstrated in every case of bronchial asthma and hay fever that is subject to an identified antigen. It is demonstrated in the blood of these individuals by injecting the serum of the sensitive person into the skin of a normal person and testing that site with the antigenic excitant. In every case if proper conditions are observed a wheal will result from the test injection in the skin. The reagins differ from anaphylactic anti-

bodies, first in the fact that they are not capable of sensitizing unstriated muscle. Since anaphylactic antibodies do not sensitize the human skin, the two sensitizing substances are in this respect diametrically different. They differ also in the fact that the reagins will not neutralize the respective antigen. Every other known antibody neutralizes and eliminates its respective antigen. Antitoxin neutralizes toxin and stops its toxic effects; precipitin precipitates its antigen and anaphylactic antibody neutralizes its antigen; but reagin has no effect whatever on the corresponding excitant. This fact explains why, although an individual may have many reagins in his blood, the injection of a small quantity of the excitant under the skin will be carried through the blood to the sensitive tissues and there produce the constitutional reaction. If there were anything like that amount of ordinary antibody in the blood of that individual, the antigen would never reach the susceptible tissues. Let us take antitoxin, for example: Only 1/100 of a unit of antitoxin per cm. is needed in the blood of a human being to render that person insensitive to diphtheria. Toxin injected into the skin of such a person will be neutralized in the blood before reaching the susceptible tissue. The excitant in hay fever and asthma on the contrary is not affected in the slightest degree by any quantity of reagins with which it comes in contact in the blood on the way to the susceptible tissue.

The atopic shock tissues in the human being differ from the anaphylactic shock tissue (unstriated muscle) in two respects. In the first place, the atopic shock tissues are not susceptible to specific influences in the normal, that is, the non-atopic person; secondly, not all of the several shock tissues (the ophthalmic, bronchial, nasal, gastrointestinal and cutaneous) are susceptible in every atopic individual; one may have asthma only or hay fever only, and this, as we have already mentioned, is subject strictly to inheritance.

We can now turn to the stated subject, which is the skin as a shock tissue. It is a remarkable fact that the

skin exhibits itself as a shock tissue under varying circumstances and with very different reactions. Let us consider, for example, the wheal. The wheal can occur under four different circumstances, first, by simply sensitizing a site in a normal skin and testing it with the excitant to which the individual from which the serum was taken is sensitive. We sensitize with serum from subjects of hay fever, asthma or eczema. We then inject the excitant into the skin in that site and a wheal is produced. Secondly, the atopic individual himself, whether he suffer from asthma, hay fever or eczema, if tested intradermally with the excitant of his particular form of hypersensitiveness will exhibit a wheal at that site. This wheal is produced because the skin is constantly sensitized with the individual's reagents circulating in the blood. We do not have to assume any specific hereditary quality of the skin in the production of a wheal under these circumstances. Thirdly, an individual subject to hay fever or asthma after subcutaneous injection of an overdose of the excitant will sometimes develop a generalized urticaria. Here again for the same reason as mentioned above, it is not necessary to assume a special inherited quality of the skin in the production of urticaria. Finally, if the patient is suffering from asthma due to some food, when that individual ingests the food an urticaria may take place; again, not on account of any inherited quality of the skin but because the skin is sensitized by circulating reagents in the blood.

In *dermatitis venenata* we have an exhibition of the skin as a shock tissue with a lesion that is characteristically different from the wheal. There is no difficulty in distinguishing this lesion from that of the wheal. What the difference is due to here, I am not prepared to say, but certainly it need not be considered as due to any inherited quality of the skin, because *dermatitis venenata* occurs in non-atopic individuals as well as atopic. Furthermore, the *tuberculin reaction* in the skin is different from either the wheal or the lesion of *dermatitis venenata*. The cause of this difference has not been really studied, except-

ing so far as to observe that histologically the tissue of the tuberculin reaction resembles to some extent tubercular tissue.

Now we come to the question whether in the skin there exists a form of hypersensitiveness that can be distinguished from the three just described and can be considered as due to some inherited quality of the skin, and the only form that meets these requirements is specific eczema. In specific eczema we have a lesion that is characteristically different from the wheal. There may be gradations between the two, but an outspoken eczema can always be distinguished from urticaria. Comparing these two lesions of hypersensitiveness, we see that they are both due to the same kind of excitant; indeed, eczema and urticaria may be produced in two individuals by the very same food. Secondly, the reagents in the two instances are the same; they are not distinguishable; i.e., reagents in eczema if transferred to normal skin sensitize the skin but when you test that site, you do not produce eczema, you produce a wheal. Hence, in every respect in which they can be studied, the reagents causing specific urticaria are identical with those causing specific eczema. This leaves us only one possible explanation of the difference between the two lesions, since the causes are otherwise the same, and that must be a hereditary peculiarity of the skin in the eczematous individual. When we examine the eczematous individuals in this respect, we find considerable suggestive evidence of a hereditary influence. In the first place, the eczema of this kind occurs often in children that have either asthma or hay fever or who, after they have outgrown the eczema, develop asthma or hay fever. Furthermore, there is very often a positive atopic family history in these cases.

The lesson then in this comparison is that in *specific eczema we have a distinct pathological clinical entity which is separable from the other forms of hypersensitiveness of the skin.*

ALLERGY IN SKIN DISEASES

SIGMUND POLLITZER

(Delivered before The New York Academy of Medicine, December 6, 1928.*)

It was no doubt noticed even by primitive man that the ingestion of certain articles of food was followed by abnormal or unusual effects in some individuals, abnormal or unusual inasmuch as these articles of foods did not produce similar effects in most people. It is a matter of common experience that shell-fish, strawberries, etc., while useful and agreeable articles of food in general, when introduced into the alimentary canal in a small number of individuals are regularly followed by distressing cutaneous symptoms. Most people can spend a day in our fields or forests without any untoward effects, but a few will suffer within a few hours from an inflammation of the skin, resulting from contact with certain plants. Most druggists can handle novocain, mercury, ipecacuanha, etc., with impunity but a small number will develop a dermatitis from contact with one or other of these drugs. Masons may handle cement, bakers flour, all their lives, but in a few instances, an insignificant percentage of people engaged in these occupations, a dermatitis of the hands and face results from contact with these substances, a dermatitis which recurs on each renewed contact with them.

These are simple and well-known examples of a condition, which until twenty years ago, was explained as due to idiosyncrasy. I say explained, but of course nothing was explained by using a word which implies merely that a given effect was unusual and peculiar to an individual. On the other hand, the use of the term allergy or atopy for these unusual effects implies a definite theory of their pathogenicity, takes them out of the order of unexplainable mysteries, and groups them with a class of phenomena which may be the subject of exact laboratory experiment.

Under allergy I understand a state of hypersensitive-ness which results from the parenteral introduction—

* Program presented in cooperation with the Section of Dermatology and Syphilis.

through the skin or through the mucosae—of substances foreign to the organism, bringing about changes in certain cells, so that thereafter, the organism responds to renewed introduction of these substances in a peculiar and specific manner. I pass over the question whether this hypersensitiveness is always the result of an immune-biological process like that which follows the injection of a foreign protein into the circulation or not. The special workers in this field are not agreed on this question. I am using the term allergy in this paper without prejudice.

Certain it is that an enormous number of substances of the greatest variety, ranging in chemical constitution from the most complex organic molecules to the most simple inorganic bodies, are capable of inducing a state of specific hypersensitiveness.

The conception of allergy has profoundly altered our views of the pathogenic mechanism of many diseases. Its most brilliant results have been achieved in the field of two common diseases affecting the mucosa, hay fever and asthma, both of them conditions in which certain diseases of the skin are frequently present. The frequent association of urticaria, prurigo and eczema with asthma and hay fever has long attracted the attention of clinicians, but in the absence of a clue to a causal connection, it was regarded as merely a coincidence or dismissed as an inexplicable phenomenon. It has been shown that hypersensitive individuals are commonly hypersensitive to more than one substance. It is not uncommon to find that an allergic individual responds to cutaneous tests with a pronounced positive reaction to a great variety of substances. In a case of hay fever with sensitization dermatitis dating from infancy, Dr. U. J. Wile (personal communication) found that ninety out of a hundred of the various articles tested gave a positive reaction. Matthew Walzer has recently shown in an ingenious and carefully planned study that, contrary to the commonly accepted belief of physiologists, whole or but partly altered molecules are almost constantly passing through the alimentary mucosa into the

blood in some individuals. Such facts seem to indicate that the mucosae of the respiratory tract and of the alimentary canal in some individuals are peculiarly permeable to foreign substances, so that hypersensitiveness may be established to an enormous number of common articles. It has been definitely established that foreign proteins readily pass through the milk glands and through the placenta so that sensitization may occur in earliest infancy or even in utero.

Studies in the heredity of skin diseases in man present peculiar difficulties. Skin diseases as a rule are not of such importance as to make a marked impression on the memories of the patients' descendants. Then, too, they are often regarded as something to be ashamed of. They are not talked about. It is but rarely that we find an example of family hypersensitiveness such as Bloch reports, a mother, two daughters and two grand-children, hypersensitive to primrose. With asthma the condition is quite different. The great suffering, the profound disturbance occasioned by an attack of asthma in an individual, cannot be hidden from the family. We are therefore able to get a history of asthma often extending through several generations. The heredity of asthma following Mendelian laws has been definitely established in an enormous series of cases, beginning with the work of Coca and Vander Veer. In view of the many close relationships between asthma and some skin diseases, it would seem likely that cutaneous hypersensitiveness too is an hereditary character.

The diseases of the skin which we have come to regard as due to hypersensitiveness are urticaria, angioneurotic edema, prurigo, the toxico-dermas, and finally eczema.

It is a matter of common knowledge that acute urticaria follows the ingestion of certain substances in some individuals. The number of substances capable of producing this eruption is countless. They are for the most part if not always proteins, but W. Jadassohn has shown that it is possible to produce urticaria by means of a pro-

tein-free dialysate. An apparent difficulty at times encountered in attempting to arrive at a diagnosis of the particular substance which produced the reaction is found in the circumstance that the patient may tell us that he has frequently partaken of this substance before without disturbance. An obvious explanation is afforded by what we know of the mechanism of sensitization. It is not the presence of the peccant substance in the alimentary canal that causes the rash. The seat of the disturbance is in the capillaries of the skin which have been sensitized by a previous contact with the substance brought to them through the circulating blood. The process of antibody formation itself occasions no symptoms which can be recognized. The antibodies produced remain fixed in the cells of the capillary walls and a reaction takes place with each succeeding contact of these sensitized cells with the allergen. The harmful substance may have passed through the alimentary canal a hundred times before, but once through some accidental circumstance, it passed more or less unchanged through the intestinal walls into the blood, constituting there a foreign protein. In practice, the problem of determining the cause of the urticaria is complicated by the circumstance that it is often some accidental ingredient of the foodstuff and not the food itself which is the responsible factor. Thus, it may be the presence of some substance in the cow's milk, derived from the food of the animal and not the milk itself which is the antigenic agent. Balyeat narrates a case in which the patient sensitive to peanuts developed a reaction on partaking of milk from a cow that had eaten peanut vine. In the majority of cases of urticaria we have little difficulty in arriving at the probable cause of the disturbance, by closely questioning the patient as to what he had eaten a few hours before the attack began. Often, however, we see the patient after his urticaria has lasted for two or three days and then he may fail to recall the caviar or anchovies with which he commenced his dinner or the few salted almonds he nibbled in the course of it. It is only in those cases in which the urticaria is due to some com-

mon article of diet like egg, milk or bread, which continue indefinitely as chronic urticaria until the allergen is removed from the diet, that we encounter real difficulties. It is in these cases—as well as in other sensitization dermatoses—that we have been in the habit of employing skin tests for diagnostic purposes.

Skin-testing substances and skin tests have been exploited for commercial purposes to such an extent that both the medical and the lay public have come to look upon these tests as an infallible method of ascertaining the cause of an allergic disorder. I have myself been a victim to this delusion, but have now virtually ceased employing them. In my experience skin tests have never given me a clue to the cause of the disorder. As a result of many hundreds of tests made for the most part by experts in this field, I have learned that one patient reacts to pork and to cauliflower—articles of diet of which he never partakes—or that another reacts to a dozen or more different substances, the rigid exclusion of which from his diet brings no visible benefit whatever. I recognize the fact that clinicians occasionally report striking results from skin tests—I have in mind Schloss' classical case of hypersensitiveness to egg (and even in that case the skin test was positive only occasionally)—and that in cases of hay fever and asthma these tests are frequently of the utmost value; but in skin diseases the results are so very rarely of any use and moreover proper carrying out of the tests so tedious and expensive that I do not regard them as worth making. On inquiry among my colleagues, I find that dermatologists in general have come to place very little dependence on these tests. Much confusion exists on this subject which I hope the immunologists will clear up. It is with regret that we must discard a diagnostic procedure so ingeniously conceived and so definite and precise in the response promised.

In chronic urticaria, as in other allergic diseases of alimentary origin, we usually can arrive at a conclusion by inquiry into the history of the case and a careful investigation and control of the diet. The patient should keep a

diary in which he records everything that he eats day by day, and meal by meal, together with a note as to the state of his rash. The repeated coincidence of a particular article of food with an exacerbation or a renewed outbreak of urticaria will provide a clue as to the cause. The definite proof will be afforded by the disappearance of the rash on excluding this article and a fresh outbreak on again partaking of it. Failing to reach a conclusion by this method, it is my practice to put the patient on a rigid vegetable diet restricted to a few articles for eight or ten days. If the rash clears up, it may be assumed that the allergen is an animal protein. To ascertain the particular substance causing the trouble, the patient is then instructed to introduce a single animal protein, such as milk, into his dietary, without making any other change, and if no disturbance follows, to try another, for instance, eggs, the next day, and so on, until a fresh outbreak discloses the cause of the trouble. If no relief follows the exclusion of animal foodstuffs, I reverse the test, put the patient on a strict milk diet and if freedom from the outbreak follows, I introduce each day another vegetable product. In a small percentage of cases of urticaria the harmful substance is not a foodstuff at all, but may be air-borne: Dust from epidermic scales, such as hair, feathers, wool, etc., or pollen. In these cases it requires careful "detective" work to obtain a clue to the cause of the trouble. In a recent article on food allergy, Rowe¹ presents an excellent scheme for testing food allergy by elimination and trial to which I would refer the reader. I have gone into this discussion at some length because the general principles of the determination of the cause of food allergy apply not less to urticaria than to other forms of allergic diseases.

Angioneurotic edema bears such close analogy to urticaria that we need not dwell on it here. It differs mainly in the seat of the sensitized cells. It is not in the superficial vessels as in urticaria but in a larger vascular trunk

¹ Rowe, A. H., *Jour. A. M. A.*, Vol. 91, 21 p. 1623, Nov. 24, 1928.

in the hypoderm that the reaction occurs. Angioneurotic edema affects not only the skin but also the mucosa of the alimentary canal and occasionally of the respiratory tract where the acute swelling may constitute a grave menace to life.

Prurigo, both the Hebra type and the prurigo diathésique of Besnier, begins as a pruritus, the most frequent symptom in all forms of skin sensitization. With the occurrence of papular urticaria and wheals the picture is soon changed by the secondary effects of scratching and eczematization or lichenization is produced until we have extensive areas of chronic thickening of all the layers of the skin. There are minor differences between these two forms but they are of no importance for our present discussion. Prurigo is frequently associated with asthma and hay fever.

The group of toxico-dermas which include the drug eruptions, constitutes one of the most interesting forms of allergy. In the first place they afford a clear example of allergy produced by non-protein substances. In the second place, while the drugs differ widely among themselves in chemical constitution—metals, alkaloids, coal tar products, resins, turpentine, halogens, essential oils, etc.—the number of types of skin eruption is limited, so that drugs with the greatest difference in structural constitution produce similar eruptions, and with the exception of the fixed pigmented erythema of antipyrin, phenacetin, phenolphthalein and arsphenamin, and possibly the herpetic eruption of arsenic, no eruption is absolutely characteristic of a particular drug or group of drugs. As with urticaria and angioneurotic edema, the seat of the lesion is in the blood vessels of the skin and though, in a number of drug eruptions, mercury, salvarsan, quinine, etc., the epidermis is involved, this effect is probably only secondary. It is furthermore noteworthy that the mucous membranes are not affected in drug allergy, and that the allergic reaction bears no relation to the ordinary clinical or pharmacological effects of the

drug. The sensitized individual may respond to an infinitesimal amount of the drug. I have seen a quinine rash appear as the result of taking the minute trace of quinine contained in the soda-water-fountain drink called callisaya and soda. Dermatologists rarely have any difficulty in recognizing a drug eruption, but the ignorance of the patient sometimes presents an obstacle to the diagnosis. He may deny emphatically that he has taken any drugs whatever, forgetting the laxative tablet containing phenolphthalein, or the remedy to "break a cold," containing salicylates or quinine which he has been in the habit of taking. It may be mentioned that the pustular lesions of iodine and bromine are not examples of allergy. They are due to the direct action of the drug on the pilo-sebaceous apparatus through which they are in part excreted.

Eczema, constituting about one-fifth of all cases seen in dermatological practice, is the most important of the skin diseases with which we have to deal. For more than a century dermatologists have been struggling with the idea of some peculiar constitution of the blood, a diathesis or a metabolic disturbance, which makes the occurrence of eczema possible. Even to-day, that idea has not entirely been abandoned, and much valuable time and effort is wasted in research on the chemistry of the blood in relation to eczema. With the coming of the bacteriological era, some forty-five years ago, many forms of eczema were recognized as due to the effects of micro-organisms in the skin. A serious obstacle in the way of progress in this field has been the attempt to separate eczemas of known causation from those whose origin was unknown, thereby, as Bloch has said, making our ignorance the basis of classification. A disorder of the skin characterized clinically by redness, swelling, itching and vesiculation, and histologically by signs of inflammation in the upper corium, together with acanthosis, parakeratosis and spongiosis in the epidermis was called eczema when we did not know what caused it; but if it was due to Rhus, primrose, wheat flour, furs, formalin, or other chemicals—if its cause was known—we called it dermatitis. There

is no reasonable basis for this distinction. In my opinion eczema is due either to the direct action of bacteria and fungi, or it is a manifestation of allergy.

In an elaborate series of experiments, Bloch has shown that the skin of the eczematic differs from that of the normal individual in that it is hypersensitive to a variety of test substances, *e.g.*, quinine, formalin, mercury, primrose—to a far greater extent than is the skin of non-eczematic individuals. Expressed numerically, seven eczematics reacted to one or more of these substances, where one normal individual gave a reaction, and, moreover, the eczematic usually reacted to several of the test substances whereas the normal skin seldom reacted, if at all, to more than one. Eczema occurs when an eczematogenous substance comes in contact from without, or by way of the blood stream, with a skin sensitized to that substance.

Contact with primrose provokes an eczema in very few individuals. Bloch has succeeded in obtaining a crystallizable, non-nitrogenous substance from primrose leaves, of which a concentrated ethereal solution provokes an eczema when applied to the skin of any individual, and thereafter that individual probably through life, certainly for a number of years, remains hypersensitive to primrose leaves, contact with which provokes an eczema not only at the site originally treated, but over the entire cutaneous surface. We have in this experiment a reproduction of the process that is puzzling to the layman and often to the physician. The baker with an eczema from flour, the lady with an eczema from a hair dye, will object to our diagnosis on the ground that contact with these substances is not new, but has been going on for years without producing any disturbance. It is precisely the prolonged and intensive contact with these substances that has finally resulted in their absorption and the production of hypersensitiveness.

As might be inferred from the frequency of eczema, the number of eczematogenous substances is enormous. While some of these substances are proteins, the majority prob-

ably are non-proteins, just as it is the non-proteins which produce drug eruptions. Some of these substances produce eczema in a large number of people, some in a few, and some but rarely. Whether a given substance will provoke an eczema, an urticaria, or a toxico-derma depends probably on the particular anatomical element in the skin in which the corresponding antibodies have been fixed.

In the clinical treatment of sensitization-eczema it is, of course, of fundamental importance that the exciting agent be found. Unfortunately we are successful in our search in only a small percentage of these cases. On the other hand it is a fact that we cure a great many of them. As I look back over a dermatological experience of forty years I recall innumerable cases of eczema which have been cured by the remedies at our disposal, without regard to a possible allergic cause for the disease. This fact suggests the possibility that sensitization of cutaneous tissues may not be permanent and that it may be destroyed by the treatment employed, especially by the more powerful reducing agents which we have long regarded as exercising an influence on the deeper tissues of the skin, and above all by the Roentgen rays. I offer this hypothesis with considerable hesitation, unsupported as it is by experimental evidence, though fortified by daily clinical experience.

In practice it is often possible to bring about a cure by the complete change of the patient's environment. A patient with a recurrent erythema and edema of the face and hands, in whom hundreds of skin tests gave no results of value, and that baffled every attempt at determining the cause, was completely cured by a month's stay in the Engadin and there has been no recurrence since her return home three months ago. Another, who lived in a country town where she came much in contact with garden flowers is rapidly losing her eczema of fifteen years' duration since she has changed her residence and studiously avoids flowers. A gentleman attacked by an almost universal eczema last spring was entirely cured by a trip to

Europe and remained free while abroad only to experience a recurrence on returning to his home. His rash again disappeared during a month's stay at Atlantic City but on returning to his home six weeks ago the rash recurred. It seemed obvious that the cause of the disturbance was localized in his own home. On my advice he moved to a hotel and in two weeks the rash has virtually disappeared. In this case the probable cause of the trouble was an insecticide which had been sprayed on his bedding, furniture and rugs last spring, traces of which can be removed only with greatest difficulty.

It is manifestly impossible, within the necessary limits of this address, to cover the subject of allergy in skin diseases except in an inadequate manner. I have not touched on the subject of allergy from physical agents—heat, light, cold, etc., which appears to be an established fact, nor have I mentioned the effects of bacterial sensitization in chronic infections. Dermatologists are well acquainted with the forms of skin diseases known as tuberculides and trichophytides, where the cutaneous lesion is modified by the allergic state of the tissues in which the respective organisms may be deposited. I have said nothing of possible relations of the autonomic nervous system nor of the endocrine glands to allergic diseases. Time does not permit.

The doctrine of allergy has thrown a brilliant light on the field of dermatology. The subject is new; a large number of careful observers in all parts of the world are actively engaged in the study of the problems involved. We may look forward hopefully to the day when methods of determining specific allergy are perfected and a great advance will have been made in the treatment of allergic dermatoses.

DISCUSSION

ABRAHAM WALZER: It has indeed been a great pleasure to have the privilege to listen to the speakers to-night. I think we have all been very fortunate in having heard a most comprehensive discussion on the question of hypersensitiveness, as it applies especially to dermatology, by men who are indeed the recognized masters in their respective fields of medicine.

Owing to the magnitude of the subject I shall limit my discussion to only some of the immunological aspects of urticaria and eczema, especially the chronic and recurrent types, because it is in these diseases I believe that many of the conceptions of hypersensitiveness, so ably presented by the speakers to-night, are well demonstrated.

Dr. Coca has stressed the conception that the skin as a shock tissue can respond to more than one type of lesion as a result of an immunological reaction, *i.e.*, the skin will respond to either urticaria or eczema when it reacts to antigen-reagin stimulation. Besides this peculiar tendency of the skin it has another important property—a non-immunological stimulation of the skin may produce a lesion similar to that of an immunological reaction, *i.e.*, local intradermal injections of such drugs as morphine, codeine, histamine, etc., will produce wheals which are clinically and morphologically identical to those wheals produced as the result of immunological stimulation.

We have experimentally produced wheals on practically every type of skin by various external non-specific means, as the local intradermal injections of histamine. These wheals are non-immunological in mechanism. We have also produced wheals by way of the gastro-intestinal tract, *i.e.*, by the process of local passive transfer of sensitivity from a patient who is sensitive to a certain food. From the injection of the serum of this patient into a subject and then feeding that subject the specific offending food a wheal resulted at the injected site. In this way we have produced the wheal which is immunological in mechanism.

We have also produced wheals on many types of skin lesions, as psoriasis, scleroderma, keloids, ichthyosis, skin atrophies, angioneurotic edema, etc. These wheals were also produced by the method of local passive transfer of sensitivity, that is, we injected the serum of certain food sensitive patients into these particular lesions and then fed the subject the offending food. These wheals were all immunological in mechanism. In other words, we have been able to produce wheals in every conceivable type of skin, normal and abnormal, atopic and non-atopic; all types of wheals were clinically similar but not so in mechanism. We must therefore bear in mind that lesions of all urticarias are clinically and morphologically alike; but all urticarias are not alike in mechanism, some being immunological and some non-immunological.

These facts from a practical point of view are very important. Since all urticarias are not atopic, all urticarias should not be exposed to indiscriminate skin testing. It is for this reason, this common tendency of skin testing every urticaria, that an important diagnostic procedure, skin testing for hypersensitiveness, has fallen into disrepute, especially amongst dermatologists.

As regards eczema, specific hypersensitive eczema, I heartily agree with Dr. Coca in his conception of this particular type of eczema—that the fundamental cause of specific hypersensitive eczema lies in the peculiar quality of the skin. As far as we know, all the factors concerned in the atopic eczema, as the reagents, the excitant, and the other factors concerned in the mechanism of the reaction, are all similar both in eczema and in urticaria, as was brought out by Dr. Coca. The only difference therefore must lie in the specific hypersensitiveness of the skin which will under proper stimulation produce an eczema rather than urticaria; and the main etiological factor for this specific type of skin or shock tissue is heredity. We can support this contention that heredity plays a great part in the etiology of the type of a topic eczema by histories obtained in many of these cases. It is a frequent occurrence to

obtain a familial history of hypersensitive skin, which can be traced through two or even three generations.

The interesting feature connected with this type of eczema is that we cannot experimentally reproduce the lesion of eczema even in an eczematous individual; for when testing the skin of a positive case of atopic eczema, we have this specific shock tissue, the eczematous skin, and we have the excitant, and the reagents, still, on testing we get a wheal—not an eczema. This may possibly be explained by the fact that the antigen instead of being deposited in the injected site through natural channels is directly injected into the skin.

We have seen the counterpart of this in our experimental urticaria studies where we were able to produce a certain type of wheal which we designated as Type 2. These wheals we were only able to produce through the gastrointestinal tract, *i.e.*, we passively sensitized a site on a subject and fed that subject the specific offending food. We were never able to obtain this type of wheal on direct testing, again illustrating the fact that in this particular type the urticarial wheal, as in specific eczema, the offending substance had to reach the skin through the natural channels and by natural means through the blood stream, not by local intradermal injection.

There is another question which perhaps should be answered—whether we can dermatologically select these specific atopic eczemas from the whole group of eczemas. I do not think we are yet able to do this, since, up to the present time, no studies of these types of cases along this line have been made.

Many of these patients (atopic eczemas, especially those that are protein sensitive) show or give a history of involvement of other organs with atopic manifestations, *i.e.*, many eczematous cases demonstrated such lesions associated with the skin condition, or gave a history of asthma or hay fever at some time previous. With such additional clinical data a diagnosis of this type of eczema may not be very difficult.

may contain wool, feathers, linen, silk, etc. It may prove general sensitization, but I cannot see what else it will prove.

One remark Dr. Pollitzer made about drug idiosyncrasy brings up a point with regard to taking of drugs. As regards laxatives, I have found that patients do not consider laxatives as drugs nor headache powders as drugs. If prescribed by a physician they are, but otherwise not. The buying of such patent laxatives over the counter is not considered the taking of drugs and in history taking that is an important point to remember.

The question of dermatitis versus eczema is altogether too long to go into. All these cases are dermatitis, and perhaps the best classification is into dermatitis of known cause and of unknown cause. Eczema is a good deal of a scrap basket. In some cases the poison reaches the skin from without but not from within, and in others the poison reaches the skin from within and not from without. That brings us to one other point, *i.e.*, sensitization of the skin by bacterial toxins from a focus of infection. This is a subject that has not been studied to any extent; we are only on the outskirts of it.

There was recently reported at a dermatological society meeting, the case of a man suffering from eczema, who had been the rounds of dermatologists without improvement. He went to a general hospital and there it was found he had a pus kidney which was removed and then the eczema disappeared.

I had a case of chronic eczema for which I could find no cause, but the patient had chronic appendicitis, and after the removal of the appendix there was no recurrence of eczema. In other words, I think the skin is sensitized to many organisms and responds to the flooding of the system with toxins by the production of rashes. This is not as revolutionary as it sounds.

Dr. Pollitzer referred to the occurrence of tuberculides, *i.e.*, eruptions of various forms in patients already suffer-

ing from tuberculosis caused by the lodgement of the tubercle bacillus or of toxin produced by the tubercle bacillus. I believe at the present time it is considered that many of these so-called toxi-tuberculides are not necessarily tuberculous but may be caused by chronic streptococcus infection. This altered reactivity of the skin is best exemplified by syphilis. If a healthy man is inoculated with spirochaetes on the skin, he reacts by development of a primary sore, characterized by certain well known features followed in a few weeks by secondary eruption. That is the reaction of normal skin.

Supposing a man has had syphilis for a year and then is inoculated with spirochaetae. He does not get the same reaction; he does not get a chancre or secondary eruption. The skin has become immune; the skin has become entirely different. Again, wait ten years and you will find he still has spirochaetes in the body; if he be struck on the shin he frequently develops a gumma on the site of the trauma. Normal skin does not react that way, neither does the skin of a patient in the secondary stage. The reaction of the skin is altered by tuberculosis and by syphilis, but the reaction in the two diseases is absolutely different.

Another disease in which I am particularly interested is less common, *i.e.*, systemic trichophytosis. My attention was called to that subject in rather a dramatic fashion. A child was brought to the dispensary who had a dirty, crusted head, with an eruption on the body looking something like scarlet fever or measles, with a fever of 101° , and I had no idea what the child had. On getting the scalp cleaned up it was apparent she had tinea capitis, the severe type known as Kerion. The rash was a secondary rash caused by toxins produced in the scalp and absorbed into the blood. The following week I read Dr. Bloch's article in the *Annales de Dermatologie*, which explained the whole situation. Those cases are not common in this country, because Kerion is not common. I have seen exactly similar eruptions occur in the skin of patients suffering from ringworm of the feet; the rash disappeared

with the disappearance of the original lesion. Dr. Mc-
 Classon has reported a case of erysipelas-like eruption of
 the legs occurring with tinea of the feet and not re-appear-
 ing when the tinea was cured. I saw a case in which the
 ringworm organism was demonstrated from the feet and
 the erysipelatous eruption, which had recurred for years,
 did not occur after the tinea was cured. He had
 large erysipelatous swellings on the legs, high temperature
 and absolute prostration but, unlike erysipelas, the fever
 would drop and in twelve hours he would be out playing
 golf. It is to this class of eruptions, not satisfactorily
 studied but which I think are vitally important, that I
 wish to call your attention this evening, *i.e.*, eruptions on
 the skin caused by irritation of previous sensitized skin
 by bacterial toxins.

DR. COCA: Dr. Williams asked whether reagins are
 specific. They are. This is the only property by which
 we could identify the reagins—that they would sensitize
 the normal skin site to the same substances to which the
 original individual was sensitive, and furthermore, where-
 ever there was multiple sensitivity we have always been
 able to demonstrate a multiplicity of reagins to match
 this state. Also Dr. Williams asked about the specificity
 of room dust. He doubted it because of it being such a
 heterogeneous mixture, but, strange to say, we find a speci-
 fic excitant in room dust which can be to a certain extent
 freed from other dirt or other soluble or dialysable sub-
 stances, and the individual sensitive to room dust has cir-
 culating reagins that will sensitize the normal skin to the
 excitant in dust. This excitant cannot be identified with
 any other known excitant. If there is a dog in the house,
 the dust does not give a reaction in an individual sensitive
 to a dog. The excitant in house dust behaves exactly like
 the pollen excitant; it must be some vegetable substance.

It is the same thing in house dust the world over. In Europe, Australia and Canada people have been found to be sensitive to our house dust extract as well as their own.

I was interested in the case of eczema due apparently to some infection. We know that the atopic shock organs are susceptible to non-specific influences. We have only to recall the instances of asthmatic patients that are affected by various non-specific influences, such as cold air or certain gases, etc. There is a form of asthma which very likely is due to infection of the upper respiratory tract and which is not due to specific sensitization to the bacteria concerned; when these infected foci are cleared out, the asthma disappears. That corresponds exactly to the case of eczema which clears up after an operation upon an infected abdominal organ.

I am grateful to Dr. Walzer for his discussion of my paper. He has the advantage of being able to speak not only as a dermatologist but as an immunologist. Dr. Politzer mentioned primrose, especially the experiments with the active substance in this plant by Bloch. Bloch used his experiments against the theory of the inheritance of atopic hypersensitiveness, but that argument is answered at once by the fact that *dermatitis venenata* is not an atopic condition. No doubt primrose has the position in Europe with regard to dermatitis that ivy and sumach have in this country. Contact is evidently necessary for the development of sensitiveness to poison ivy. Eskimos never come in contact with poison ivy and are completely insensitive to strong extracts of poison ivy, but their near relative, the American Indian, is as sensitive to poison ivy as the white people, *i.e.*, 60 per cent. The reason the Europeans are not primarily sensitive to primrose is that they do not come in sufficient contact with the excitant to develop sensitiveness. The primrose excitant evidently is not airborne as is the oleoresin of poison ivy. An individual highly sensitive to poison ivy has only to drive through a district where poison ivy grows and he returns with a dermatitis affecting all exposed parts.

If one wishes to object to the evidence that so clearly points to a hereditary basis of asthma, hay fever and now of specific eczema, one must not assail it with evidence drawn from a different category of specific hypersensitivity.

SERUM PROTECTION AND SERUM TREATMENT OF POLIOMYELITIS *

(ABSTRACT)

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The pandemic of poliomyelitis of this era which has startled the world may be dated from 1908-1909 and had as forerunner the gradually enlarging epidemics of Norway and Sweden between 1869 and 1905. These earlier outbreaks led to a remarkable series of studies by Medin, Leegard and others, culminating in the brilliant epidemiological investigation of Wickman in 1905, which has become the basis of our present beliefs. The thorough study of Wernstedt of 1913 supplemented and confirmed the views on the mode of infection in poliomyelitis previously put forward by Wickman. We owe, therefore, the determination of the infectious origin of poliomyelitis to Medin and Leegard, and indeed to Caverly, who investigated an isolated epidemic in Vermont in 1894; and we owe the demonstration of the person to person carriage to Wickman, Wernstedt, Frost and their successors.

The knowledge of poliomyelitis as an epidemic disease dates from the investigations just mentioned, but our present far more complete and detailed knowledge of the pathology of the malady rests less upon studies of human cases than upon the successful communication of the disease to animals. This success is due in the first instance to

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Landsteiner, who in 1909 inoculated rhesus monkeys; next to Flexner and Lewis who accomplished monkey to monkey passages; and subsequently to many other investigators in Austria, France, Germany and America.

Present belief, based on the epidemiology of the human affection and upon the experimental disease produced in monkeys, is that the virus of poliomyelitis, as the infective agent is called, enters and leaves the body by way of the upper respiratory mucous membrane, and especially in the secretions of the nasopharynx. The virus has been detected in the secretions and the substance of this membrane, both in man and monkey. Moreover, the monkey, a relatively resistant species, can be infected by merely instilling a virus of sufficient potency into the nares.

The precise path which the virus takes to gain access to the brain and spinal cord from the nasal membrane can be deduced with tolerable certainty. The virus appears not to pass first into the blood, through which it is carried to the nervous system. Much larger quantities of virus injected directly into the blood do not suffice to infect monkeys. On the other hand, there are cogent reasons for believing that the virus ascends along the olfactory nerve filaments which unite the mucous membrane of the nose to the olfactory lobe of the brain. Probably the descent is also by way of these filaments, in the reverse direction. Since there are reasons for believing that the virus reaches not only the brain but also the cerebrospinal fluid in this ascent, it is likely that the movement upward and downward takes place in the lymph channels of the nerves, rather than in the axis cylinders themselves. Once the brain is reached in this movement, the spread of virus may occur by contiguity of nervous tissues; but as the early clinical manifestations are oftener paralyses of the extremities than of the bulb, it is inferred that the cerebrospinal fluid receives the virus early.

However this may be, and whether the virus ascending along the olfactory nerves works its way along the brain to the more vulnerable spinal cord, or is carried there by

the cerebrospinal fluid, it is quite certain that before it can strike injuriously it must overcome certain obstacles to its penetration. We are informed of two sets of obstacles: One, discovered by Amoss and Taylor, resides in the nasal membrane itself; the other, determined by Amoss and myself, is bound up with the anatomical integrity of the choroid plexus and meninges. If one of these obstructive mechanisms fails, the other may still operate effectively; but if both fail, the result is probably infection and paralysis. Between these two extremes there appear to be partial failures of the protective mechanisms, which may be taken to account for that wide, if not yet accurately defined set of clinical manifestations yielding immunity from subclinical and the several clinically abortive forms of poliomyelitis now described.

Since poliomyelitis is an infectious virus disease, from which recovery in whole or in part commonly occurs, it is not surprising to discover, in view of general knowledge of the class of virus diseases, that recovery results from specific immunization in which a rapid production of immune bodies takes place. These immune bodies have been detected in the blood as early as the sixth day of acute illness; and after recovery from the paralytic disease they have been found to persist in the blood in some degree of concentration as long as twenty years. Moreover, they are detectable in the blood of persons with mild and abortive attacks of poliomyelitis and even in so-called normal persons who have been suspected of subclinical immunization. This last class corresponds of course to other recognized forms of subclinical infection, *e.g.*, diphtheria, leading not to actual illness, but to active immunity.

With this knowledge of the clinical pathology of epidemic poliomyelitis before us, we may inquire whether the employment of already made immune bodies is capable of influencing and moderating the experimental or the natural human form of the disease. It is of course apparent that the first step in this inquiry is to determine the effects of the immune bodies as represented by convalescent

escent serum on monkeys. The convalescent serum is taken from recovered cases of poliomyelitis in man and monkey. Thus far it has not been found possible to produce an immune serum in any animal other than the monkey. Since the virus of poliomyelitis is distinct from streptococci, it seems quite empirical and futile to employ an antistreptococcic serum for specific therapeutic purposes.

The procedure employed by Lewis, Amoss and myself to determine the specific protective powers possessed by the convalescent serum was, first, to mix virus and serum outside the body and inject the mixture into the brain of monkeys. This mode of inoculation is the severest test of infectivity which can be employed. When suitable combinations of virus and serum are used, no paralysis results. When insufficiently neutralized virus is injected, the usual incubation period of the experimental disease is prolonged, but ultimately paralysis develops. The next procedure is a far more severe test of the potency of the convalescent serum. The virus is injected into the brain of the monkey, followed by the serum injected by lumbar puncture into the cerebrospinal fluid. When the virus is introduced into the brain, it is deposited in injured brain tissue, under conditions favorable to its protection and multiplication. A part always passes into the cerebrospinal fluid and is carried everywhere in the cerebrospinal axis, including, of course, the vulnerable spinal cord. In this experiment it was hoped that the serum placed also in the cerebrospinal fluid would penetrate the nervous tissues, meet and destroy or neutralize the virus.

In practice this result was actually achieved, when optimal relations of virus, serum, and period of successive injection of virus and serum were secured. In brief, then, this test showed that convalescent serum of man and monkey is capable of neutralizing the virus of poliomyelitis, once it is present under conditions suitable for multiplication in the central nervous organs of the monkey.

We have in these experimental observations the basis of specific serum therapy of poliomyelitis in man. As Dr. Aycock is to deal with this topic in detail, I shall confine myself to a few chronological items only. The experimental results obtained by Lewis and myself were published in 1910, and in 1911 Netter of Paris first applied them to the treatment of early cases in man. A far more comprehensive and basic study of the subject was made by Amoss and Chesney in 1916, during the severe epidemic in New York State. They concentrated attention on early paralytic and preparalytic cases. When marked paralysis existed, betokening severe injury to the nervous system, it was not believed that benefit would accrue from the employment of the serum. It has now become the rule to inject the serum before obvious paralysis occurs. This preparalytic stage of poliomyelitis can be detected by means of accurate clinical and laboratory tests.

I shall now leave this important topic to Dr. Aycock whose experience has been extensive, and devote the remainder of my remarks to the subject of convalescent serum prevention of poliomyelitis.

In order that you may have the subject before you in a clear form, I would like to preface these remarks by a few facts bearing on the anatomical and physiological conditions which predetermine the successful employment of the serum for purposes of passive or protective immunization.

We have already learned that the virus of poliomyelitis passes from the nasal mucosa to the nervous system. It is well known that complex chemicals, including protein, do not pass from the blood to the cerebrospinal fluid as long as the meninges and choroid plexus are anatomically intact. These structures constitute a real barrier between the blood and the substance of the brain and spinal cord. But the barrier is very sensitively adjusted, and can quite readily be impaired by artificial means. Injecting so innocent a fluid as Ringer's solution, and the even more innocent cerebrospinal fluid from another monkey of the same

species, into the subarachnoid space, suffices to open the barrier. When a serum is injected by lumbar puncture, a marked aseptic meningitis is produced and the gates are thrown wide open to the constituents of the blood.

The effects of this impairment can be shown by placing on the nasal mucosa a virus in itself incapable of producing poliomyelitis, or injecting into the blood a quantity of virus impotent in the normal monkey. In both instances, infection and paralysis may follow.

However, this anatomical and physiological impairment of the meninges and choroid plexus may be rendered ineffective if convalescent serum is introduced into the cerebrospinal fluid. By this means the action of the virus in the nares and in the blood may be effectively blocked.

Up to the present, you will have observed that the convalescent serum has been brought directly into relation with the nervous organs through contact with the cerebrospinal fluid. The question arises whether the relation can be secured through the serum injected into the blood. From what has already been stated about the choroid plexus meningeal barrier, this is not to be expected normally; but it may well be expected when the meninges are inflamed. Now, in all cases of symptomatic poliomyelitis, no matter how mild, changes are probably to be found in the cerebrospinal fluid. These changes betoken inflammation, and inflammation indicates a broken barrier. Under these circumstances convalescent serum injected into the blood, may pass into the cerebrospinal fluid and act to block an impending virus infection.

Amoss and I had indeed already followed immune serum from the blood into the cerebrospinal fluid under some such conditions as these, and Stewart and I have recently carried the implications of these considerations into practice by determining that convalescent serum introduced into the blood of monkeys will prevent an intracerebral injection of poliomyelitis virus from producing paralysis. It is hardly necessary to point out the significant applica-

tion of this observation. If in time of danger from epidemic poliomyelitis, adequate supplies of human convalescent serum were available, they could doubtless be employed for purposes of passive immunization.

There remains one more matter of practical importance to touch upon. As you will learn from Dr. Aycock's presentation, the specific serum treatment of early poliomyelitis is carried out by injecting the serum into the subarachnoid space and into the blood of patients. It is customary to make a second intraspinal injection when practicable. The question which Stewart and I undertook to answer is whether the effects of the serum so injected passed off quickly or endured for a time. We found that when 2 cubic centimeters of convalescent serum are injected by lumbar puncture, monkeys are protected against intracerebral inoculation of the virus for at least four days. I am, therefore, of the opinion that while the first intraspinal injection is essential, the second may not be so, and that the continued presence of immune serum in the nervous tissues may be sufficiently provided for by the convalescent serum which has been injected into the blood.

SALPINGITIS *

CHARLES E. FARR and ROBERT E. FINDLAY

A detailed study has been made of all the cases of salpingitis admitted to the First Surgical (Cornell) Division of the New York Hospital from January, 1914, to December, 1927, inclusive. The cases number 545. A simple classification has been adopted as follows:

1. Acute
2. Acute exacerbation
3. Chronic
4. Tuberculous

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Of all the cases of salpingitis admitted, 545 as above stated, 115 or 21 per cent were acute, 114 or 21 per cent were acute exacerbation, 293 or 54 per cent were chronic, 26 or 5 per cent were tuberculous.

AGE

Salpingitis occurred in this series in individuals as young as eleven and as old as sixty. The average age was 29. Four patients were under 16 years of age. Three of them had never menstruated. Even in these, however, it is doubtful if the tubal infection followed on a juvenile vulvo-vaginitis. A careful study of the incidence at various ages reveals no data of significance.

The marital history was investigated but without results; 420 patients claimed the marriage state; 83 were single; 37 were widows and 5 were divorced. It would not be wise to place too much credence in these data.

The occupations of these 545 women were studied carefully but nothing of any great interest was found; 308 women claimed to be house-wives or were engaged in house work; 59 were domestic servants; 36 were factory workers; 10 were actresses; 9 were telephone operators; 7 were dressmakers; 7 were stenographers; 6 were clerks; 4 were school teachers and the others were scattered.

The symptomatology and laboratory signs of salpingitis were next investigated as follows:

LEUCOCYTOSIS

A leucocytosis was present in practically all cases on admission, the general average count being 14,500 with 80 per cent polymorphonuclears. The highest was 45,000; the lowest 4,500. The highest polymorphonuclear count was 98, and the lowest, 34.

In acute salpingitis the highest count was 45,000; the lowest, 7,000; the average, 17,000, with the polymorphonuclear percentage ranging from 98 to 61, and giving an average of 84.

Acute exacerbation gave a leucocytosis from 36,000 to 8,000, with an average of 17,000. The polymorphonuclear percentage ranged from 95 to 64, with an average of 83.

Chronic cases yielded a leucocytosis ranging from 28,000 to 4,500, with an average of 11,000. The polymorphonuclear percentage ranged from 90 to 34, with an average of 74 per cent.

Tuberculous salpingitis also showed a leucocytosis ranging from 23,000 to 6,000, with an average of 12,500. The polymorphonuclear percentage ranged from 88 to 67, with an average of 79.

From a combined study of these figures it is seen that there is a leucocytosis in practically all instances of salpingitis, even of the chronic and tuberculous type. This leucocytosis seems relatively high for the amount of pyrexia present in the average case. It is also in our opinion somewhat higher than that seen in similar types of appendicitis. The polymorphonuclear count is high in all forms, even the tuberculous.

FEVER

It is noteworthy that nearly all salpingitis patients whether acute or chronic have some fever. In our series the highest was 105.2, the lowest 97.6, average 99.5. Average for acute cases was 101.3. For the acute exacerbation the average was 101.1, for the chronic cases the average was 98.1. In the tuberculous types the average was 100. These are all initial temperatures. We believe that a comparison of a similar series of appendicitis in women for corresponding ages would show that salpingitis as a rule gives a higher temperature reaction than appendicitis.

HISTORY, SYMPTOMS AND PHYSICAL SIGNS

The history, while of the utmost importance in salpingitis, is also extremely hard to obtain accurately. Many of these women are ignorant, many are careless, and not a few are distinctly adverse to giving an accurate history.

It is important to gain the confidence of the patient and by tactful questioning obtain any history which directly or indirectly would indicate an infection of the tubes. In our series the average remote onset was four and one-half months before admission to the hospital, while the duration of the present illness varied from a few hours to three months with an average of twelve and one-half days.

Considerable stress should be laid upon the chief complaint as stated in the history, especially if the history be well taken. It is noteworthy that nearly 44 per cent of all patients complain of their nausea or vomiting or both. Nearly 10 per cent more complain distinctly of indigestion, that is complaints of heaviness in the epigastrium, heart-burn, gastric distension, belching of gas and sour material. These complaints strongly simulate peptic ulcer or cholecystitis rather than appendicitis.

An interesting complaint was that of headache, which occurred in 14 per cent of our salpingitis series. This was a distinct complaint and evidently of ovarian origin.

Dysuria was found in only 18 per cent, while urinary frequency was present in only 12 per cent. This is an interesting contrast to what we are generally taught; that dysuria and urinary frequency are cardinal signs of infection of the genital tract.

A history of gonorrhea could be obtained in only 3 per cent of the series. This was almost invariably blamed on the husband.

A complaint of vaginal discharge was found in 64 per cent. In many instances this was but a slight leucorrhea but, of course, a majority had a considerable amount of yellowish discharge, with occasionally a foul odor. It is interesting to note that 36 per cent gave no history or manifestation of vaginal discharge. This again is contrary to the usual teaching.

Dysmenorrhea was present in only 22 per cent and as other pelvic pathology in the same cases could easily account for the dysmenorrhea it could hardly qualify as a

cardinal symptom of salpingitis—indeed irregular menstruation is considerably more frequent, being found in 31 per cent.

THE LOCATION OF THE COMPLAINT OF PAIN

No points of especial interest or value were found in a careful analysis of this series. The pain was in both lower quadrants in 48 per cent, in the right lower quadrant in 31 per cent, in the left lower quadrant in 17 per cent. It was present also in the back in 32 per cent. An interesting observation was the presence of pain in the epigastrium in 4 per cent. This is quite a marked point in differentiation from appendicitis in which a very great majority have initial pain in the epigastrium. In appendicitis these gastric pains quickly radiate to the right iliac fossa and disappear from the epigastrium, while in salpingitis, if the pain is in the epigastrium, it usually remains there without radiation.

Other interesting factors obtained from the history were vaginal bleeding in 43 cases; chills in 74; the complaint of fever in 73; sweats in 9; menorrhagia in 9; metrorrhagia in 11; occurrence after the menopause in 3, before puberty in 3, during pregnancy in 3, and associated with syphilis in 9.

In only 72 of our series was there a history of immediately preceding operation, miscarriage or delivery. Thus 13 per cent of the series may be puerperal but even in these it was impossible to determine the presence or absence of gonorrhea.

TYPE OF PAIN

An attempt was made to elicit from the patients a descriptive word or two as to the type of pain. Nothing of special value was brought out however. The pain was called "cramplike" in 17 per cent. In 6 per cent it was intermittent. It was stated to be distinctly worse on exertion in 8 per cent, and was described as "sharp" in 3 per cent. Painful defecation was mentioned in 2 per cent and

a falling sensation in 1 per cent. Many other descriptive terms were used but not in sufficient numbers to have any clinical significance.

Many other complaints were mentioned such as loss of weight, flatus, hot flashes, diarrhea, green stools, urinary retention, sterility, constipation, hemorrhoids, etc.

PHYSICAL FINDINGS

The most important physical sign in salpingitis is abdominal tenderness. This was present in 83 per cent, being present in both lower quadrants 41 per cent; in the right lower quadrant 28 per cent; in the left lower quadrant 16 per cent; the others were scattered. In marked contrast to this and also in very marked contrast to the signs of appendicitis, abdominal rigidity was noted in only 25 per cent in the entire series.

Vaginal examination revealed tenderness in the fornices—bilateral 40 per cent; right fornix 16 per cent; left fornix 11 per cent.

Masses were found by vaginal examination in 38 per cent. These were situated as follows: Both lateral fornices 8 per cent; right fornix 15 per cent; left fornix 11 per cent; cul de sac 7 per cent.

An interesting observation was the presence of abdominal distension in only 9 cases. This is hardly credible and must be due to lack of careful observation. However, it is quite probable that abdominal distension is much less marked in salpingitis than in appendicitis.

Abdominal masses were found in over 8 per cent. This is an important finding as one does not ordinarily expect to feel abdominal masses in salpingitis.

DIAGNOSIS

The diagnosis of salpingitis can be made in a very large percentage of cases with great ease both from the history and the physical signs but a considerable percentage offers

much difficulty. We would emphasize the importance of the history and the fact that it must be taken with great care and with tact in order to obtain anything like a true picture. Fifty-four per cent of our series were easily diagnosed; 13 per cent more were fairly easy; 5 per cent were in doubt, but probably were salpingitis; 14 per cent were difficult, but were classed as salpingitis eventually, while 7 per cent were wrongly diagnosed either through carelessness or indefinite or incomplete histories and physical examinations, or what is far more probable, because the symptoms and physical signs did not give a clear indication of the real pathology.

DIFFERENTIAL DIAGNOSIS

The chief difficulties in differential diagnosis are to distinguish salpingitis from appendicitis, ectopic gestation, and cystoma of the ovary. Many other pathological conditions may also simulate salpingitis and are not infrequently a complication of it.

Naturally appendicitis in one of its many forms offers the chief difficulty in diagnosis. In 19 per cent of all our cases this had to be considered, whereas the possibility of ectopic gestation was considered in 7 per cent; cystoma of the ovary in 7 per cent; fibroid of the uterus in 6 per cent; retroversion in 5 per cent. Many other possible complications were also considered. Endometritis and ureteral colic were not uncommon in this series.

INDICATIONS FOR OPERATION

Eighty per cent of all our cases were operated upon. Of the acute cases 70 per cent were operated upon and of the acute exacerbation, 83 per cent; 82 per cent of the chronic cases were subjected to operation, and all but one of the tuberculous.

From a careful survey of our results and those of other operators it may be stated with considerable surety that acute salpingitis should never be operated upon; that acute exacerbation should not be operated upon; that

chronic salpingitis, except the tuberculous, should be operated upon; and that the tuberculous should never be subjected to surgery until every other therapeutic resource has been exhausted.

OPERATIVE PATHOLOGY

There was no special enlightenment from the exhaustive study, from the findings at operation, nor the methods of operative surgery; nor did we obtain any great amount of knowledge from the cultures and smears from the tubes. This is readily understood because the tubes become sterile within a few weeks of the onset of the infection.

The question of drainage is quite important. Our records show that drainage is used much more rarely in recent years—the average being 20 per cent for the entire period. It is believed that drainage can be dispensed with in all cases except those with oozing surfaces or with large accumulations of fibrinous exudate.

Involvement of the ovaries was present in a very large proportion of our cases. This caused partial oophorectomy many times. It was rare indeed that both ovaries were removed.

The appendix was removed in 287 instances but only in a small proportion was there a definite acute disease of the appendix. A few showed acute appendicitis in addition to the salpingitis and one was tuberculous. Many other incidental complications were found but none of any special etiological significance. The most common were endometritis, retroversion, fibromyoma and ectopic pregnancy.

Wound healing in general proceeded normally but a moderate infection occurred in 14 cases. General peritonitis was present in 28. A fecal fistula formed in 7 and peritoneal adhesions were noted in 16. Many other incidental complications were noted.

Pulmonary embolism occurred in 2 cases; lobar pneumonia in 2; broncho-pneumonia in 2; pulmonary tuberculosis was present in 4 instances.

There were two deaths on the table from ether narcosis.

MISTAKES IN DIAGNOSIS

In 70 per cent of our cases salpingitis was correctly diagnosed. In 3 per cent diagnosis was not made, or at least not posted on the chart. In 27 per cent the diagnosis was incorrect. The proper diagnosis in these latter cases should have been: Appendicitis—53; retroversion—18; ectopic gestation—15. In 13 cases the tuberculous nature of the salpingitis was not recognized.

WHEN TO OPERATE

The rules for operation in salpingitis on the Cornell Division of the New York Hospital are as follows:

1. Acute cases should never be operated upon. This, of course, is subject to an exception where there is a reasonable doubt as to the diagnosis, and particularly when appendicitis or ectopic gestation are possibilities. In case of doubt, we usually operate, but frequently if we find very acute salpingitis, we close the abdomen without attempting to remove the tubes. This may cause a later operation but the mortality is much lower.

2. Operation is not indicated even in a general peritonitis following salpingitis. Practically all cases will recover under conservative treatment.

3. If the salpingitis is not a very severe process it is advisable to remove the tubes even though they are acutely inflamed. The only exceptions are in young girls and those who are especially anxious to have children.

4. In acute exacerbation it is unwise to operate just as in the acute cases. It is better to wait five days after the temperature has reached normal.

5. It is wise to remove all chronically inflamed tubes if there are no contra-indications. This is especially true when tubes are closed.

6. Tuberculous tubes in general should be allowed to quiet down and then be given every possible hygienic care before operation is advised.

MORTALITY

In this series there were 15 deaths, giving a general mortality rate of 2.75 per cent and a post-operative mortality rate of 3.42 per cent. This includes all fatal issues while the patient was still in the hospital. Twelve of the fifteen deaths were in patients operated upon during active infection. This gives a mortality rate of 9.45 per cent for the acute cases. When one considers that the mortality rate in acute appendicitis is about 5 per cent it is readily seen why operation in acute salpingitis is most unwise.

Causes of death were as follows: 9 from general peritonitis; 4 sudden deaths on the operating table (a comparison of one sudden death on the operating table in 1500 cases of acute appendicitis); 1 of intestinal accident obstruction; 1 acute dilatation of the stomach; 1 cerebral; 1 lung abscess.

There were only 22 (5 per cent) secondary operations in this series during the hospital stay. They were almost entirely for the relief of residual abscesses. There was one intestinal obstruction and one ectopic pregnancy. There was one immediate post-operative hernia and one fecal fistula.

The post-operative results are very interesting but our data are not as accurate as could be desired. These women did not coöperate to anything like the extent that other similar groups did in our service.

Three per cent developed post-operative ventral hernia. Nine of these herniae followed abdominal drainage. The

question of post-operative pregnancy was studied as carefully as our records permitted but we are unable to give any light on this subject. Sixteen reported pregnant, but of these three only had living children; 4 developed ectopic gestation; 2 had miscarriages; 6 were too early in pregnancy at the time of examination to be sure of the result. Forty per cent of our series returned and were judged as giving satisfactory results. A further 20 per cent were considered satisfactory but with complaints of a minor character; 18 per cent were not traceable; 13 per cent were re-admitted for one complaint or another, usually of a pelvic nature. Ten per cent were uncoöperative and no post-operative records were made.

CONCLUSIONS

Salpingitis is a serious disease. Its diagnosis is not easy and treatment requires much surgical skill and judgment. Acute cases should never be operated upon. There should practically be no mortality in chronic cases. The end results are fairly good, considering the nature of the disease and the many complicating factors.

LUNG ABSCESS SOME ASPECTS OF ETIOLOGY AND MEDICAL TREATMENT *

JAMES ALEXANDER MILLER

ETIOLOGY

The generally accepted idea of the etiology of pulmonary suppuration has been that it follows certain cases of pneumonia in which, because of certain conditions in the lung little understood, necrosis and suppuration result instead of the more usual process of resolution.

* Delivered before the Sections of Laryngology and Rhinology, and Medicine, November 28, 1928.

Certain etiological factors have been recognized as especially favoring the development of pulmonary suppuration, such as the inhalation of foreign bodies, operations upon the respiratory tract, especially tonsillectomy and the extraction of teeth, and less frequently following operations upon suppurative foci in more distant parts of the body. In all of these conditions the conception has been that pneumonia first occurred and that then later following the pneumonia there was suppuration.

Dr. Adrian Lambert and I in studies of a considerable series of abscess of the lung were impressed by the fact that a very considerable percentage of the cases apparently occurred without any evidence of either pneumonia or of any of the predisposing factors above mentioned. The fact, also, that in cultures made from these lung abscesses very frequently none of the ordinary pathogenic bacteria could be found, although the abscesses swarmed with anaerobic bacteria, led us to suspect that possibly the anaerobic organisms played a real pathogenic role in the formation of the abscess instead of simply the secondary one which had been ascribed to them.

It is significant also that the anaerobes found in abscesses correspond to a group frequently found in persons with bad oral hygiene, particularly diseased tonsils and pyorrhea alveolaris.

Since that time a considerable amount of experimental evidence concerning the role of anaerobes in the formation of abscesses has been elicited. Klein and Smith have produced pulmonary abscesses in animals by intratracheal injections of the scrapings from infected teeth.

Crowe and Scarf injected the sinuses of dogs with such scrapings and obtained abscesses of the lung in two out of six cases.

Fetteroff and Fox found infected emboli in the bed of removed tonsils.

Cutler and Schlueter were able to produce pulmonary abscesses by placing emboli infected with anaerobes in the jugular vein of animals.

From these experiments it would appear that abscess of the lung may be produced either by inhalation of infection or through the blood stream by embolus from more distant parts of the body. It also appears to be proved that the anaerobic bacteria frequently found in the mouth will produce abscesses of the lung experimentally under certain conditions.

The anaerobes which have been found most commonly, both in dirty mouths and in abscesses of the lungs, are some of the spirochaetes, fusiform bacilli, vibrios, motile bacilli of the colon group and anaerobic streptococci.

The important practical application of these newer ideas of the possible role of the anaerobe in the production of pulmonary abscess is the fact that operative procedures, especially tonsillectomy and tooth extraction in the mouths of persons with poor oral hygiene, produce ideal conditions for the transmission of these organisms to the lungs and point to the extreme importance of cleaning up the mouth very carefully prior to any such operation. It would appear that as a preventive procedure this is most important and is probably more so than the much discussed problem of the relative danger of local and general anaesthesia for such operations.

MEDICAL TREATMENT

Early abscess of the lung should be considered primarily as a medical disease. Chronic pulmonary abscess usually calls for surgery.

REST AND POSTURE

It is our experience that rest, combined with proper postural treatment, is the best method to be employed first in the treatment of early pulmonary abscess. From forty-five to fifty per cent of early abscesses recover by this means alone. It has long been known that a certain number of abscesses of the lung cure themselves completely by spontaneous rupture and evacuation. It is the object

of this medical treatment by rest and posture to increase the number of such cures and the advantage to the patient of avoiding operation with a very long convalescence and frequent surgical dressings, to say nothing of the danger of the operation itself, is very evident.

We have also found that surgical operation during the acute phases of abscess of the lung carries with it a very high mortality, sixty-five to seventy per cent. By careful frequent x-ray examinations we believe it is possible to gauge the point when this acute inflammation about the abscess is subsiding and when such x-ray studies are associated with frequent surgical consultation, as they should be, it is usually possible to judge of the phase of the disease in which operation can be performed with the least risk and with the best hope of success.

On the other hand, if the lung lesion does not clear up satisfactorily after one or two months of this conservative treatment, we have found that it probably will not and that then surgery should be called upon. If this medical treatment is persisted in too long, the case drifts into the chronic stage and operation then again becomes more dangerous and complete cure is less apt to occur because of the liability to permanent bronchial fistula or to the failure of the abscess to close completely on account of the rigid fibrous walls which have been allowed to form.

Medical care, therefore, consists mainly in insisting upon rest and postural drainage during the early acute stages, and later consists in the exercise of proper judgment as to whether this treatment alone is likely to succeed, rather than to allow the case to become too chronic and less favorable for the surgical operation which will eventually be necessary.

BRONCHOSCOPY

In association with rest and posture, we have used bronchoscopy as an aid in the treatment of certain cases in order to assist drainage. We usually employ this method in cases which do not respond in a few weeks to

rest and posture alone before resorting to more radical surgery. When foreign-body inhalation is suspected or possible, bronchoscopy is indispensable both for the diagnosis and for the cure by removal of the foreign body.

On the other hand, we believe that the practice of long continued bronchoscopy over many months is mainly palliative and has the same unfavorable effect as does the long-continued medical treatment, allowing the case to become so chronic as to be surgically unfavorable.

ARTIFICIAL PNEUMOTHORAX

Artificial pneumothorax has been advocated by some as an ideal method of treatment for abscesses of the lung. We have used this method in a considerable number of cases and found it very unsatisfactory and sometimes dangerous. If the abscess of the lung is situated near the periphery the introduction of air into the pleural cavity may result in the tearing of adhesions, with the rupture of the abscess into the pleural cavity and the occurrence of a very fulminating empyema, which is generally fatal.

On the other hand, the air introduced by the method of artificial pneumothorax can not be exactly controlled and sometimes it will get in between the lung and the mediastinal pleura, resulting in a cutting off of the drainage rather than in favoring it. We believe that the principle of artificial pneumothorax as it is used in pulmonary tuberculosis is mainly for immobilization of the infected organ. The principle of treatment in pulmonary abscess, on the other hand, is drainage, which is by no means always favored by this method.

SUMMARY

1. Abscess of the lung is frequently caused by the post-operative infection from infected mouths.
2. Cleanliness of the mouth is a very important prophylactic measure in avoiding post-operative pulmonary abscess.

3. The diagnosis of pulmonary abscess is comparatively simple and depends largely upon x-ray evidence.

4. The treatment of acute pulmonary abscess is primarily medical by rest and posture.

5. Bronchoscopy is a valuable aid in some cases and is indispensable in cases due to the inhalation of foreign bodies.

6. Medical treatment and bronchoscopy should not be continued so long that the case becomes chronic.

7. Surgery is necessary in about fifty per cent of the cases and if employed at the favorable stage is not attended with serious risk. It is usually the only treatment for chronic cases.

8. The close coöperation of the nose and throat surgeon, the internist, the surgeon and the bronchoscopist is essential to obtain the best results.

EXCERPTS FROM THE MINUTES OF THE COUNCIL

JANUARY 30, 1929

The Trustees reported that the expenses of the Academy for 1928 were \$259,465.93 and the income \$267,846.19; and that the balance of \$8,380.26, consisting of \$6,204.63 of restricted funds for poliomyelitis, etc., and \$2,175.63 of unrestricted surplus, had been added to the Furniture and Fixture Reserve. The land, building and contents is valued at \$2,560,070.97. The total of the various funds amounts to:

Total invested	1,934,696.25
Balance uninvested	<u>23,313.67</u>
Possible tax refund.....	6,542.24
Streeter pledges	13,443.00
Cash	<u>3,328.43</u>
	23,313.67
Income account invested.....	<u>55,460.37</u>

There has been received from the Rockefeller Foundation \$500,000 account principal and \$12,500 account income for 1929. With the advice of the Advisory Finance Committee the sum of \$563,287.50 has been invested.

The report of the Library Committee was presented and it was moved and duly carried that the Council approves of publishing in the By-Laws and in the Rules and Regulations of the Library that Library subscription fees shall be \$40 for individuals and \$100 for commercial firms. It was also

Resolved, that the Council of the Academy learns with great satisfaction of the interest which has been taken in our incunabula by Dr. Arnold Klebs of Nyon, Switzerland, and hereby expresses to Dr. Klebs its very deep appreciation of the valuable services which he has rendered this institution. It was also

Resolved, that the Council hereby expresses its appreciation and thankfulness to Dr. Frank C. Hollister for his donation of the Argellatta incunabula.

It was moved and duly carried that the Council is still in favor of affiliation between the Pathological Society and the Academy being consummated.

It was also moved and duly carried that an invitation be extended to the Society for Experimental Biology and Medicine to use one of the Academy meeting rooms on the third Wednesday of the months of October to May inclusive with lantern and operator free of charge.

It was also moved and duly carried that the hospitality of the Academy be offered to delegates to the International Hospital Congress and that they be informed that they may use the Academy as a mailing address. It was

Resolved, that the Council feels that no one except a Fellow of the Academy should enter into discussion at any meeting of the Academy or its Sections unless especially invited to do so and that this matter be referred to the By-Laws Committee for consideration.

CATALOGUE OF AN EXHIBITION OF MEDICAL MANUSCRIPTS AND INCUNABULA

An exhibition of some of our oldest manuscripts and medical incunabula (books printed before 1501) was set up in the Library and ready for the meetings of the History of Science Society which were held on 28th and 29th December. Many of the books came to the Academy with the E. C. Streeter collection which was purchased by the Academy in the spring of 1928, the rest of the volumes were already in our possession. Altogether we have about one hundred and thirty incunabula but we could not show them all in the exhibition cases which were available. Dr. E. C. Streeter, of Boston, himself together with Dr. Arnold C. Klebs, of Nyon, Switzerland, are largely responsible for the choice which was made for the exhibition. Those which were shown are worthy of notice as examples of the printer's art or because they are editions of medical works which exerted a strong influence at the time they were published. We are deeply indebted to these gentlemen for their help. Dr. Klebs is a widely acknowledged authority on early printing and the history of medicine and we are reaping the benefit for he is very kindly cataloguing all our incunabula.

The exhibition is being kept open throughout the months of January and February. The entries, copied from the cards placed in the exhibition cases with the books, are arranged chronologically.

MANUSCRIPTS

Guilielmus de Saliceto (of Piacenza).
La chirurgia.
Italian Manuscript, dated Bologna 1268, with which is bound:

Guilielmus Parmensis.
Chirurgia and other tractates.

Latin Manuscript, dated 1469.

(Francisc. de Senis, de balneis. Petras de Abano. tract. de venenis.
Arn. de Villanova. De arte cognoscendi venena.)

Avicenna (Ibn Sina).

Canonis libri ii et iii interprete Gerardo Cremonensi.

Manuscript in Latin, Italy, end of XIIIth century.

Avicenna or Ibn Sina (980-1036) of Bagdad was court physician and vizier to different caliphs. The *Canon* was an attempt to codify all medical knowledge and to show how it fitted in with the systems of Aristotle and Galen. It was the authority in the Middle Ages.

Serapion (Junior).

Liber de medicinis simplicibus.

Manuscript, Italy, early XIVth century.

Collection of alchemy, philosophy, etc.

Manuscript. ? Italy, XIVth century.

Opened at St. Thomas Aquinas 'De motu cordis'.

Arnoldus de Villanova.

Aphorismi medici.

Latin Manuscript XVth century.

Guy de Chauliac.

Inventorie or the Collectorye in Cirurgicale parte of medicene

Manuscript in English, late XIVth century or early XVth.

The author (1300-1368), of Avignon, was the most distinguished authority on surgery in the XIVth and XVth centuries. The only other known MS. in English is in Paris. Possibly the copy was made for John of Gaunt. It would be a treasure in any library. Besides the illuminations there are illustrations in the text.

Anonymous Latin Manuscript.

Early XVth century.

The incipit states that "here are given prescriptions made out according to my experience [word erased] from [word erased] to 1424 month of December after the ninth book of Almansor". It is therefore a commentary upon Rhazes' popular textbook.

INCUNABULA

Nicolaus Salernitanus.

Tractatulus quid pro quo and Sinonima.

Venice, Nicolaus Jenson, 1471.

The author flourished about 1100. The antidotarium should precede the two little tracts contained in this fragment. The *Sinonima* is a dictionary of simples.

Petrus Lombardus.

Liber sententiarum.

Strassburg, Heinrich Eggestein, not after 1471.

living. Johannes de Turrecremata, a powerful prince of the church in Rome, wrote the second tract for the salvation of the soul. It was exceedingly popular throughout the Renaissance.

Guainerius, Antonius.

Opera medica.

Pavia, Antonius de Carcano, 1481.

Antonio Guaineri was a member of the famous faculty of Pavia and a colleague of Gianmatteo da Gradi. Like the latter he represented the pure Arabic and scholastic trend of learning before the advent of the Renaissance. He merits study, however, as his clinical observations, notably those on aphasia, are very shrewd.

Dondis, Jacobus de.

Aggregator.

Venice, Michele Manzolo, 1481.

The author (1298-1359), "citizen of Padua", was a mathematician and horologist. The book is the first great dictionary of treatment and gives the drugs and simples under Greek, Latin and Arabic names.

Abraham Ben-'Ezra.

De luminaribus et diebus criticis.

Padua, Matthaeus Cerdonis, 1482.

The author (?1092-1167), a Spanish Jew, was a philosopher and astronomer. This astrological book is about critical days in disease.

Bartholomaeus Anglicus.

De proprietatibus rerum.

Nuremberg, Anton Koberger, 1483.

The author, an English Franciscan monk, flourished 1230-1250. This work is an encyclopaedia of which books 5, 6 and 7 are medical. Note the interesting initial letter done by hand.

Arnoldus de Villanova.

Breviarium practicae.

Milan, Christophorus Valdarfer, 1483.

Arnoldus de Villanova (1253-1312) was a doctor of theology, law, philosophy and medicine. He made some independent observations. This book was one of the best medieval handbooks.

Opusculum repertorii pronosticon et Hippocratis libellus de medicorum astrologie.

Venice, Erhard Ratdolt, 1485.

These collected treatises, some of which were erroneously attributed to Hippocrates, contain the astrological lore of the times. The knowledge of starcraft was part and parcel of the training of every physician. The printer of this pamphlet, Ratdolt, a German of Augsburg, was one of the greatest and most artistic printers of Venice. He was the first to print in several colors.

Simon a Cordo Januensis.

Clavis sanationis.

Venice, Guilielmus de Tridino of Monteferrat, 1486.

Simon a Cordo of Genoa, the translator (with the help of a Jewish scholar) of the Arab treatise on simples by Serapion, is of importance as one of the first to improve medical nomenclature. He brought order into the linguistic chaos of medieval translators. His *Clavis sanationis*, or medical synonyma, gives the results of his labours in the field of pharmacology. He was papal archiater to Nicolas IV.

Vincentius Bellovacensis.

Speculum naturale.

[Strassburg, Printer of *Legenda aurea*, ab. 1480.]

Vincent of Beauvais (died 1264) was a learned Dominican, a contemporary of Saint Louis. He produced the most exhaustive encyclopaedic work of his time on the extant knowledge of the world and its objects, the *Speculum majus*. Two parts of this book, the *Speculum naturale*, and the *Doctrinale* contain medical information.

Avicenna (Ibn Sina).

Lib. Canon. V. et libellus de viribus cordis.

Venice, Petrus Maufer et socii, 1486.

From the early XIth through to the XVIIIth century Avicenna was usually referred to as the "Prince". As such he ruled as the supreme authority in medicine. He was the great assimilator of Greek science and great also in systematizing empirical knowledge. His *Canon*, extant in numerous MSS. and editions, is fully as important as Galen's earlier work.

Savonarola, Iohannes Michael.

Canonica de febribus.

Bologna, Dyonisius de Bertochis, 1487.

Iohannes Michael Savonarola (1390-1462), grandfather of the famous Florentine reformer, worked mostly in Ferrara. His clinical work marks a distinct departure from traditional scholastic teaching. He wrote various treatises which enjoyed great vogue.

Articella or Thesaurus operum medicorum antiquorum.

Venice, Baptista de Tortis, 1487.

Contains works by Joannitius (Hunain ibn Ishaq), Philaretus, Theophilus, Hippocrates, Galen, Gentile de Fulgineo.

Ficinus, Marsilius.

De vita sana.

Florence, Ant. Mischominus, 1489.

This Florentine physician was also a member of the Platonic Academy. His treatise on the healthy life had an immense popularity in Europe.

Maimonides, Moses.

Aphorismi medici.
Bologna, B. Hectoris, 1489.

The *Aphorisms* of Maimonides (1135-1204) are chiefly abstracts from Galen and other ancient authors, but there are many modifications based on personal experience. Maimonides is also notable as an early critic of Galen.

Dinus del Garbo.

Compilatio emplastrorum.
Ferrara, Andreas Bellfortis, 1489.

Dino del Garbo, one of the eminent "expositors" of Avicenna, belongs to the school of Bologna. He came from Florence where he died in 1327. Though often accused of plagiarism, he was physician to King Robert of Sicily and commanded high fees.

Guilielmus de Saliceto.

Cirurgia.

Venice, ? printer, 1489.

William of Piacenza (*Salicetus*) was the greatest surgeon of the XIIIth century. He furthered the scientific side of surgery and technically is noted for having brought into practice the skillful use of the knife as opposed to cautery. He is also remembered for effectively fighting against the separation of surgery from medicine.

Lanfrancus, Mediolanus.

La chirurgie. Translated into French by Guillaume Yvoire.
Lyons, Jean de la Fontayne, 1490.

This is a very rare French edition of Lanfranc's treatise on surgery. Lanfranc belongs to the school of William of Saliceto. He also is Italian and has the great merit of having introduced the scientific methods of his master to the Collège de St. Cosme in Paris, thereby laying the foundation for the later brilliant activities of French surgeons.

Louffenburg, Heinrich von.

Versehung des Leibs.

Augsburg, ? Erhard Ratdolt, 1491.

Heinrich von Louffenburg's book is a German regimen of health (1429) in rhyme, with quaint woodcuts. The present edition was printed at Augsburg and is probably one of the rarest of the popular medical books. Only two other copies besides this one are registered.

Falcutius, Nicolaus.

Sermo tertius de membris capitis.
Venice, Bernardinus Stagninus de Tridino of Monteferrat, 1490.

Nicolo Falcucci, the Florentine (often confounded with his namesake of Salerno), died early in the XVth century. His great medical opus, the *Sermones medicinales*, is an elaborate compilation which brought fame to its author, in spite of the fact that it contained few original observations.

Arnoldus de Villanova.

Speculum medicinae. (ed. by Martinus Mellerstat).

Leipzig, [Lotter, 149—.]

Arnoldus, a shining light in medicine of the XIIIth century, taught mainly at Montpellier, though also at Naples and Paris. A good clinician and physician, his services were in demand by Pope and King.

Gazius, Antonius.

Corona florida. De conservatione sanitatis.

Venice. Ioh. de Forli & Gregorius fratres. 1491. June 20.

Gazio lived (1469-1530) in Padua and other Italian cities as a much sought-after physician. His *Corona florida*, a regimen of health, is based chiefly on Arabic tradition. It was very popular.

Hugo Senensis (Ugone Benzi of Siena).

Expositio in I. fen Primi Canonis Avicennae. Ant. Faventinus. De febre.

Ferrara, Andreas Belfortis Gallus, 1491. Aug. 13, with which is bound:

Barzizius, Christoforus.

Introductorium sive Ianua ad opus practicum.

Pavia. Antonius de Carcano, 1494, Aug. 20.

Ugone Benzi of Siena was one of the best known medical teachers and clinicians. He taught mostly in Padua where in 1429 he is known to have dissected the body of a criminal. Barzizi, whose chief work is bound also in this volume, was renowned for his collection of *Consilia*.

John of Gaddesden.

Rosa medicinae.

Pavia, Johannes Ant. Birreta, 1492.

The author of the "Rose of Medicine" John the Englishman, (about 1280-1361), was in many ways the typical medieval scholar, who borrowed abundantly from the Arabs. His recommendation to his confrères, to collect their fees before the cure, and his use of red cloth for the avoidance of pox marks have, however, a modern flavor. The "Rose" followed and imitated Bernard of Gordon's "Lily".

Leonicenus, Nicolaus.

Plinii ac aliorum de simplicibus medicaminibus errores.

Ferrara. Laurentius de Rubeis & Andreas Grassis de Castronovo socii. 1492, Dec. 18.

A humanistic pamphlet in the fight for and against Pliny the Elder. The letter which serves as preface, is by Angelo Poliziano, the famous poet and member of the Platonic Academy in Florence, who with his colleagues was most active and enthusiastic over the newly discovered truths of the ancients.

Collenucius, Pandolphus.

Pliniana defensio adversus accusationem Nicolai Leonicensi.

Ferrara. Andreas Belfortis Gallus. ? 1493.

Pandolfo Collenuci of Pesaro (died 1504) attacked the calumniators of Pliny the Elder. He was a conservative rather than a critical modern like Nicolaus Leonicens and Hermolaus Barbarus, who were fighting against the tyrannical authority of the ancients.

Celsus, Aulus Cornelius.
De medicina lib. VIII.

Venice, Ioh. Rubeus. 1493, July 8.

Though probably not a practising physician, Celsus has contributed one of the best balanced medical treatises that have come down to us from Galen's time. He was not discovered until the Renaissance and so was entirely unknown during the Middle Ages.

Mundinus.

Anathomia.

[Leipzig, Martin Lapsberg, ab. 1493.]

Mundino de' Luzzi (born about 1275), son of an apothecary of Bologna, wrote this little treatise of systematic anatomical investigation based on autopsies. For three hundred years it was the most important anatomical primer in the schools and was only superseded by the classical work, the *Fabrica* of Vesalius.

Barbarus, Hermolaus.

Castigationes Plinianae.
[Venice, unknown press for Daniel Barbarus, about 1493-94.]

One of the outstanding figures in the humanistic revolution of the XVth century. His castigations of Pliny the Elder's errors are an early example of the fully awakened critical spirit fighting against the tyranny of the ancients.

Gianmatteo Ferrari da Gradi.

Expositiones super 22 fen tertii canonis Avicennae.
Milan. Jacobus de Sancto Nazario de la Ripa. 1494, Nov. 17.

Gianmatteo da Gradi, about whom Albutt wrote so delightfully, in his *Greek Medicine and other Essays* was the master-mind of the old medieval school of Pavia. Though full of Arabic learning, fond of the hair-splitting methods of the Scholastics, he none the less recorded many shrewd clinical observations.

Argellata, Petrus de.

Chirurgia.

Venice, Unknown press. 1492, Apr. 28.

This is a second edition of Argellata's famous surgical work. The first appeared in Venice in 1480.

Institutoris, Henricus and Sprenger, Jacobus.
Malleus maleficarum.

Nuremberg, Anton Koberger, 1494.

Institutoris, alias Heinrich Kraemer, was a Dominican and a judge in witches' trials at the end of the XVth century in Germany. The fact

that this book is one of about ten XVth century editions shows the high esteem in which the author's skill in uncovering sorcery was held in those times.

Albertus Magnus.

Liber Physicorum.

Venice, Joh. de Forli & Gregorius fratres, 1494, ult. Jan.

At the end of the Middle Ages (XIIIth century) came Albertus Magnus and Roger Bacon, and with them began the new scientific revolution. They broke with traditional science, the former as systematic observer of nature, the latter as pioneer in experimental science. The *Physica* is a notable example of Albertus' work. But although a revolutionary, Albertus was also an erudite churchman. The *Summa* of his pupil Thomas Aquinas is still considered by some to show the deepest intellectual penetration into the secrets of nature.

Ketham, Johannes.

Fasciculus medicinae.

Venice, Johannes and Gregorius de Gregoriis, 15 Oct. 1495.

This "bundle" of medical tracts is one of the most famous of incunabula because of its beautiful woodcuts, drawn by a master of the School of Giov. Bellini. Ketham, a German physician of whom little is known, compiled the *Fasciculus*.

December, Petrus Candidus.

De genitura hominis.

[Rome, Stephan Planck, 1495.]

As a physician and member of a family renowned for their humanistic learning, Pietro Candido wrote various treatises on medical subjects in Aristotelian vein. They are more remarkable for their Ciceronian Latin than for their contents.

Avenzoar (Ibn Zuhr) of Seville.

Libri III Theisir, i.e., interpretatio et rectificatio medicationis et regiminis. Antidotarium. Emendatus per. Hier. Surianus.

Averroes (Ibn Rushd) of Cordova.

Libri VII Colliget, i.e., de medicina. Emendat. per Hier. Surianus.

Venice, Bonetus Locatellus for Octavianus Scotus. 1496, ult. May. Avenzoar (XIIIth century) and Averroes are the two most famous Arab transmitters of classical learning. These two works, the *Theisir* and the *Colliget* (corruptions of the Arabic titles), were the basis for academic lectures on medicine during several centuries.

Petrus Hispanus (Pope John XXI).

Summulae logicae cum Versoris interposita expositione.

Venice, Bonetus Locatellus for Octavianus Scotus. 1496, July 12. This is a work on logic by an author to whom is also attributed a *Thesaurus Pauperum*, or "medical "treasure" book for the poor, a work

that had immense vogue from the XIIIth century on. It is not definitely decided whether the author of these two works is one and the same person nor whether it was he who later became Pope John XXI.

Cermisonus, Antonius.

Consilia with other medical tracts.

Venice, probably Bonetus Locatellus for Octavianus Scotus about 1496.

Cermisonus (died 1441) was professor at Padua and teacher of Giovanni Michele Savonarola. His *Consilia* which deals more with remedies than with the nature of diseases, is simply a mass of undigested facts.

Savonarola, Iohannes Michael.

Canonica de febris. Venice, Christoforus de Pensis. 1496, Oct. 16.

Iohannes Michael Savonarola (1390-1462), grandfather of the famous Florentine reformer, worked mostly in Ferrara. His clinical work marks a distinct departure from traditional scholastic teaching. He wrote various treatises which enjoyed great vogue.

Serapion, Yuhanna ibn ("Junior").

Breviarium medicinae. De simplici medicina. Dictus circa instans, practica Platearii. [Venice]. Bonetus Locatellus for Octavianus Scotus 1497, Dec. 16.

Serapion was a highly esteemed Arabic author (of the XIth century) on pharmaceutical therapy. Little is known of his life.

Maimonides (Rabi Moyses = Musa ibn Maymun).

Aphorismi medici and other opuscles.

[Venice]. Bonetus Locatellus for Octavianus Scotus. 1497, Oct. 7. Famous Jewish scholar of Cordova in the XIIIth century, who later became court physician to Saladin in Egypt. This book, containing his medical aphorisms together with other medical works, is a pirated reprint of a former edition by another printer, whose name was carelessly reproduced with the stolen text.

Leoniceus, Nicolaus.

Libellus de epidemia quam vulgo morbum Gallicum vocant. Venice, Aldus Manutius, 1497.

Leoniceus was one of the most famous medical teachers of the Renaissance, in Padua and Ferrara. These three pamphlets deal with the most vital medical problem of the times, the outbreak of syphilis a few years previous.

Leoniceus, Nicolaus.

Libellus de epidemia quam vulgo morbum Gallicum vocant. Milan, Gulielmus Signerre for Johannes de Legnano, 1497.

Leoniceus, Nicolaus.

Libellus de epidemia quam vulgo morbum Gallicum vocant. Leipzig, Wolfgang Stöckel, 1500.]

Maiolus, Laurentius.

De gradibus medicinarium.

Venice, [Aldus Manutius], 1497.

Maiolus lived in the XVth century in Genoa and wrote pharmaceutical works of which this, on the degrees and strength of medicines, is the principal. A good deal of speculation entered into this pharmaceutical work.

Argellata, Petrus de.

Cirurgia.

Venice, Bonetus Locatellus, 1497.

Pietro, one of the early pioneers of Italian surgery, taught in Bologna, where he died in 1423. His surgery in VI books is important, although he lays more stress on medicaments than on operations. He was the first to perform the incision of the linea alba in post-mortem Caesarian operations.

Arnoldus de Villanova.

Brevarium practicae medicinae.

Venice. Otinus de Luna. 1497. Oct. 21.

Arn. de Villanova, a Catalonian versed in Arabic learning, was a commanding figure in medicine during the XIIIth century. He taught in the Universities of Montpellier, Naples, and Paris. His brevarium contains many shrewd clinical observations besides traditional Arabic learning.

Brunschwig, Hieronymus.

Dis ist das buch der Cirurgia.

Augsburg, H. Schönsperger, 1497.

Bound with his

Liber pestilentialis.

Augsburg, H. Grüninger, 1500.

Brunschwig was a surgeon of Strassburg in the XVth and XVIth centuries. His *Chirurgia* was the first printed treatise on surgery and was abundantly illustrated. This is a piratical Augsburg reprint of the first edition which appeared in Strassburg in the same year. His plague tractate is derived from the earlier printed work by Steinhöwl.

Brandt, Sebastianus.

Stultifera navis.

Basel, J. Bergman, 1498.

The "fools' ship", written by Brandt in Latin and German verses, reflects as does Erasmus' *Praise of Folly*, the awakening critical spirit of the Renaissance, the revolt against merely traditional information. The woodcuts have been attributed to the young Dürer who was in Basel with Brandt.

Gordon, Bernardus de
Lilium medicinae.

Venice, Bonetus Locatellus, 1498.

Bernard of Gordon, probably a Scot, taught medicine in the University of Montpellier from 1285 on. In the preface to this popular medical treatise he indicates divisions by saying: "In this Lily there are many flowers and in each flower there are seven gold-like grains".

Guy de Chauliac, Lanfranc and others.
Collectio chirurgica Veneta.

Venice, Bonetus Locatellus, 1498.

Guy de Chauliac, the great medical teacher at Montpellier in the XIIIth century, laid, with some slightly earlier Italian and contemporary French colleagues, the foundation of French scientific surgery.

Albertus Magnus.

De virtutibus herbarum.

Cologne, printer unknown, ? 1499.

This pamphlet on the virtues of herbs and stones was erroneously attributed to Albertus Magnus, the great German philosopher and pioneer of science in the Middle Ages.

Astronomici veteres.

Venice, Aldus Manutius, 1499.

This finely printed collection of classical astronomy (mainly Alexandrian) came from the famous Venetian press of Aldus Manutius. By this and similar works he contributed powerfully to the revival of scientific studies. In this book there is a commentary of Sir Thomas Linacre written to Proclus Diadochus.

Boethius.

De consolatione philosophiae.

Lyons, Johannes de Vingle, 1499.

Boethius (about 480-524), Roman patrician and last of the great philosophers, was chancellor to the Gothic King Theoderic the Great. He wrote this consolation of philosophy while imprisoned at Pavia. He exerted great influence on the thought of the Middle Ages, through his translations and interpretations of classical works, among which are several scientific ones.

Isidorus Hispalensis.

Etymologiarum libri XX.

Paris, Thielman Kerver, 1499.

Isidorus Hispalensis was bishop of Seville (about 570-636). He had immense learning and wrote many works, promoting the renewed interest in sciences generally and medicine especially. The present book, which appeared in countless editions, was a great authority throughout

the Middle Ages. His etymological interpretations are often forced and ridiculous, but the gathering of such a stock of knowledge insured the value of the book.

Brunschwig, Hieronymus.

De arte distillandi.

Strassburg, J. Grueninger, 1500.

Brunschwig was surgeon in Strassburg in the XVth century. His books on surgery and on the art of distilling medicines from herbs and other substances had an immense vogue. Grueninger who printed the present work is famed for his many earlier medical works, illustrated by woodcuts.

Bartholomaeus Anglicus.

Le proprietaire des choses, translated by Jean Corbichon.

[Lyons, probably Claude Nourry, 1500.]

Barthol. Anglicus, an English Franciscan monk, wrote this work on the properties of 'things' in the XIIIth century. It was probably the most popular compilation of the contemporary knowledge about natural objects. Nearly forty separate XVth century editions are known and there are translations into French, English, Dutch and Spanish. It contains chapters on anatomy, physiology and pathology. The English translation by Trevisa is most interesting. This very rare French edition is notable for the illustrations taken from manuscripts of which a good number are extant.

Bagellardus, Paulus, a Flumine.

De infantium asgritudinibus et remediis.

[Probably Lyons, Jean Dupré, XVth century.]

Bagellardo of Fiume, the author of this first pediatric primer, was professor at Padua in 1472. The chapters on the care of infants are particularly interesting.

School of Salerno.

Regimen sanitatis, with commentary of Arnoldus de Villanova.

Paris, Michel le Noir. 1497.

The great fame of this *Regimen Sanitatis* dates from much later times than is usually assumed. At the height of fame of the Salernitan School (XIth century), before Frederick II created the first medical code of laws, other "Rules of Health", e.g., the famous "Aristotle letter", were in vogue. Arnoldus de Villanova, who was in Salerno in the XIIIth century, probably popularized this *Regimen* in verse, which lasted through into our times.

School of Salerno.

Regimen sanitatis.

Venice, B. de Vitalibus, not after 1500.

Hippocrates.

Various tracts.

[Rome, S. Planck, 1500.]

We show two little books of the same place and printer, with slight variations.

During the period of incunabula (1460-1500) very few works of the Father of Medicine were printed. Only tracts, many erroneously attributed to him to promote their sale, were issued. This is an interesting specimen edited by Andreas Brentius, the powerful and learned churchman who lived at the time of the humanistic Pope Sixtus IV.

ANNOUNCEMENTS

The Library is anxious to increase its collection of medical portraits. Fellows are requested to send to the Library their photographs and other medical portraits which they might like to present.

There are a good many gaps in our collection of medical thèses. We should be very pleased to receive gifts of such thèses from Fellows of the Academy and others, if they can spare them.

PROCEEDINGS OF ACADEMY MEETINGS

FEBRUARY

STATED MEETINGS

Thursday Evening, February 7, at 8:30 o'clock

Program presented in coöperation with the Section of Surgery

ORDER

I. EXECUTIVE SESSION

Action on amendment to the By-Laws introduced at Stated Meeting of January 3, 1929
Election of Fellows

II. PAPERS OF THE EVENING

- a. Surgical treatment of gangrene and infection of the feet in diabetes,
Leland S. McKittrick, Boston (by invitation)
Discussion, Henry J. Spencer, John Douglas
- b. Spinal anesthesia in abdominal operations, Lincoln F. Sise, Boston
(by invitation)
Discussion, George P. Pitkin (by invitation), Malcolm T. Munkittrick
(by invitation)

Thursday Evening, February 21, at 8:30 o'clock

THE FIFTH HARVEY LECTURE

Constitutional variation and susceptibility to disease

WADE H. BROWN

Member of The Rockefeller Institute for Medical Research,
New York, N. Y.

Peyton Rous, President
Harvey Society

Philip D. McMaster, Secretary
Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for February.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, February 5, at 7:45 o'clock

ORDER

- I. DR. HOWARD FOX gave a talk illustrated with lantern slides on yaws as seen in Haiti.
- II. PRESENTATION OF PATIENTS
 - a. Cases from the Skin and Cancer Hospital, Paul E. Bechet, A. Schuyler Clark, Binford Throne, Chas. M. Williams, David S. D. Jessup, Eugene F. Traub, Herman Goodman, Wm. Bayard Long, Hermann Feit
 - b. Miscellaneous Cases

III. DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF OTOLGY

Friday Evening, February 8, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF INSTRUMENT

Modification of the eustachian tube catheter, George M. McAuliffe

III. PAPERS OF THE EVENING

a. The window operation for hematoma auris and perichondritis with effusion, Robert C. Howard

Discussion, George E. Davis

b. The modified radical mastoid operation for chronic otorrhea (Lantern slides), Hugh B. Blackwell

c. Newer developments in neuro-otology, Lewis Fisher, Philadelphia (by invitation)

Discussion, Randal Hoyt (by invitation)

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, February 12, at 8:30 o'clock

ORDER

Program Presented by the Department of Neurology, Columbia University

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. A case of oxycephaly, Samuel Atkin (by invitation)

b. A series of cases of brain tumors, Charles A. Elsberg

III. PAPERS OF THE EVENING

a. Syphilitic hemorrhagic meningo-encephalitis illustrated by pathological material (lantern slides), Irving J. Sands

Discussion, Armando Ferraro (by invitation), Leon H. Cornwall

b. Tumors of the spinal cord. Problems in their diagnosis and localization. Procedures for their exposure and removal, Charles A. Elsberg

SECTION OF PEDIATRICS

Thursday Evening, February 14, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

a. Beriberi in late infancy, Sidney V. Haas

Discussi Relia Shick

b. The natural history of rheumatic infection; evaluation of therapeutic measures, May G. Wilson

Discussion, Homer F. Swift

c. Appendicitis in children, Charles E. Farr

Discussion, Richard W. Bolling

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, February 15, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. Cases demonstrating injection treatment of varicose veins, J. S. Tunick (by invitation)

III. PAPERS OF THE EVENING

a. Injection treatment of varicose veins and ulcers, J. S. Tunick (by invitation)

b. A quantitative tuberculin test for active tuberculosis, W. I. Galland (by invitation), J. E. Blair (by invitation)

SECTION OF OPHTHALMOLOGY

Monday Evening, February 18, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICAL CASES

a. Exophthalmus due to hematoma of frontal sinus, Lewis Webb Crigler

b. Report of a case of sympathetic ophthalmia occurring 48 years after injury, with microscopical sections, James W. Smith

III. DEMONSTRATION

A plan for graphically recording motor anomalies, James W. White

IV. PAPER OF THE EVENING (9 p.m.)

The value of tuberculin in ophthalmology, Clarence King, Cincinnati (by invitation)

Discussion by George S. Derby, Boston (by invitation), John E. Weeks, James G. Dwyer, Andrew A. Eggston, A. B. Ferguson (by invitation)

V. EXECUTIVE SESSION

SECTION OF MEDICINE

Tuesday Evening, February 19, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

Symposium on Asphyxia

- a. Carbon monoxide asphyxia and its treatment, Yandel-Henderson,
Yale Medical School (by invitation)
 - b. Modern methods of resuscitation in New York City emergencies,
with motion pictures, Daniel J. Donovan, Chief Surgeon, N. Y.
Police Dept.
- A demonstration of the Prone Pressure Method will be given by the
Police Emergency Squad.
Discussion by Alvan LeRoy Barach, Charles Norris, Harry M. Archer
(by invitation)

SECTION OF GENITO-URINARY SURGERY
Wednesday Evening, February 20, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. 1. Solitary cyst of kidney—nephrectomy—lantern demonstration
2. Teratoma testis—orchidectomy—specimen, R. L. McKiernan
(by invitation)
- b. Ectopic kidney—nephrectomy—specimen, Clyde W. Collings
- c. Exhibition of a new cysto-urography table, Frederick E. B. Foley,
Saint Paul, Minn. (by invitation)

III. PAPER OF THE EVENING

Urologic and surgical care of nephrolithiasis, James N. Vander Veer,
Albany (by invitation)

SECTION OF OBSTETRICS AND GYNECOLOGY
Tuesday Evening, February 26, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. A case of endometriosis with polypoid invasion of the vagina (with
lantern slides), Samuel H. Geist
Discussion by Robert Tilden Frank
- b. Report of cases of pyometra past the climacteric, Hermann Grad
Discussion by Isidor Kross

III. PAPERS OF THE EVENING

- a. Vaginal operations in the treatment of uterine prolapse, cystocele
and rectocele, with special reference to the interposition operation,
Louis E. Phaneuf (by invitation)
Discussion by George Gray Ward, William P. Healy, Byron H. Goff
- b. Obstetrical anesthesia, S. A. Cosgrove
Discussion by Paniel Joseph Flagg (by invitation), James Tayloe
Gwathmey

Discussion of papers and cases is limited to Fellows of the Academy and
specially invited guests.

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, February 27, at 8:00 o'clock

(Please note change of hour)

MT. SINAI HOSPITAL NIGHT

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF PATIENTS
 - a. Lung abscess cured by bronchoscopy
 - b. Lung abscess cured by bronchoscopy
 - c. Lung abscess cured by bronchoscopy, M. S. Bender (by invitation)
 - d. Osteoma of antrum
 - e. Carcinoma of nasopharynx, L. Kleinfeld (by invitation)
 - f. Lateral cervical fistula
 - g. Orbital abscess following ethmoiditis; intranasal operation
 - h. Lingual thyroid
 - i. Carcinoma of eustachian tube; radium implantation
 - j. Extrinsic carcinoma of larynx; radical operation
 - k. Extrinsic carcinoma of larynx; radical operation, Rudolph Kramer
- III. REPORT OF CASES
 - a. Benign tumor of bronchus, Sidney Yankhauer
 - b. Basal cell carcinoma of antrum with pulmonary metastasis
L. Kleinfeld (by invitation)
- IV. DEMONSTRATIONS
 - a. Simplified investigation of the sphenoid sinus, Mervin C. Myerson
 - b. Irrigation of the antrum in infants and children by means of the natural orifice cannula, H. G. Goldman (by invitation)
- V. PAPERS OF THE EVENING
 - a. Intracranial complications following sphenoid infections, Rudolph Kramer
 - b. Pathological report of two cases of intracranial complications associated with infection in the sphenoid (lantern slides), J. G. Druss (by invitation)

NOTES

CATALOGUE OF THIRD ANNUAL EXHIBITION OF WORKS IN THE PLASTIC AND GRAPHIC ARTS BY AMERICAN PHYSICIANS UNDER THE AUSPICES OF THE NEW YORK PHYSICIANS ART CLUB

Held at The New York Academy of Medicine, February 2nd to 15th, 1929.

INTRODUCTION

LINSLEY R. WILLIAMS

In the early winter of 1927, a very unusual exhibition was held at the new building of The New York Academy of Medicine and as far as is known, it was the first exhibition of the kind held in the United States.

The Physicians' Art Club prepared for exhibition a variety of artistic objects which included portraits, paintings, oils, and water colors, sculpture, book plates, engravings, etchings and a variety of other interesting objects of art, all of which were executed by medical men.

This exhibit raised a great deal of interest not only among the medical profession but amongst the general public.

A similar exhibit was held in 1928 and a third is to be opened on February first under the same auspices.

A deep interest has been taken in these exhibits by the Council and Fellows of the Academy because it demonstrates that many physicians have their avocations as well as their professional vocation. It is not unusual for trained physicians to become well known in the field of art and letters. The exquisite beauty of Hayden's etchings is well known to many art students, but how many know that he was a qualified physician. The writings of Rabelais, Smollet, Holmes and Mitchell have made these physicians far more celebrated than have their professional activities, although Holmes was celebrated as an anatomist and Mitchell as a neurologist.

Gerald Webb of Colorado Springs has recently pointed out that the training of physicians stimulates their imaginations and artistic sense far more than does the study of the other liberal professions. Whether this be true or not, the fact remains that at the present time there are physicians living in England and in this country and in many other parts of the civilized world whose devotion to the arts and letters is almost as keen as their interest in their own chosen field of endeavor.

This exhibit is but another demonstration of the medical interest in non-professional affairs and it is hoped that they may be continued and will stimulate the members of this broad profession to develop an avocation which is worthy of its best traditions.

LIST OF WORKS

- ALLEN, JOHN H. (Portland)
3 Still Life
- AYER, JAMES C. (New York City)
4 Nude Study
5 Portrait of Miss Sims
6 Still Life
- BANCEL, HENRY A. (New York City)
7 Morning Landscape
8 House with Five Chimneys
9 Nantucket Fishing Boat
- BARRINGER, B. S. (New York City)
10 Golden Fall
11 Panel
12 Old Apple Tree
- BAUCH, S. (STAN.) (New York City)
13 Sails
14 Lake Tahoe
15 Sea Gate
- BERKOWITZ, JOSEPH J. (New York City)
16 The Doctor, Model 1928
- BURKE, EDGAR (Jersey City)
17 Canvasbacks
18 Ring-necked Pheasants
- CHAMPLIN, H. H. (New York City)
19 The Sigh
20 "Thrown on Her Hundred Isles" (Byron)

COHN, SALO (New York City)

- 21 Summertime
- 22 In the Catskills

CUNNINGHAM, THOM. H. (Glens Falls)

- 23 End of the Day
- 24 Scrub Pine (Etching)

DICKINSON, ROBERT L. (New York City)

- 25 Views from the Windows of The Academy of Medicine
- 26 Bookplates, Pastors and Christmas Cards
- 27 Sunset Over Moab and the Wilderness from the Mount of Olives

DOLGOPOL, VERA B. (New York City)

- 28 Etude
- 29 Etude

ELLIOTT, GEORGE R. (New York City)

- 30 Box Made of St. Domingo Mahogany which came to New York
in George Washington's Time

FISCHER, HERMANN (New York City)

- 31 October Day
- 32 Waxenstein (Etching)
- 33 Il Castello, Capri (Etching)
- 34 Mountain Lake (Etching)

FREEMAN, ALPHEUS (New York City)

- 35 The Boat Yard (Loaned by Dr. George P. Willis)
- 36 The Omar Khayyam (Loaned by Dr. George P. Willis)
- 37 Wincoma

FRIDENBERG, PERCY (New York City)

- 38 Thames Barges
- 39 Cornwall

GRANET, H. (New York City)

- 40 Lovers (Placque)

HARTSCHORN, W. MORGAN (New York City)

- 41 The Birches
- 42 Landscape
- 43 Farm, Cornwall, Conn.

HIRSCH, I. SETH (New York City)

- 44 Portrait of Mrs. H.
- 45 Moses (Sculpture)

HOLDEN, WARD A. (New York City)

- 46 Sunset
- 47 Sunset
- 48 Morning

HUNT, LEIGH (New York City)

- 49 Etaples
- 50 A Street Scene
- 51 The River Bank

- 52 Low Tide
- 53 Night—Picardy
- 54 In the Mist
- 55 In a Canal
- 56 Mattituck Creek
- JAEGER, CHARLES H. (New York City)
 - 57 The Swans of Bruges
 - 58 Phantom Ship
 - 59 Fallen Monarch
- KAHN, MORRIS H. (New York City)
 - 60 Portrait Sculpture
 - 61 Girl's Head
 - 62 Entwined
- KEYES, STANLEY J. (New York City)
 - 63 "Home with Mainsails Backed and Bows a Sea of Foam"
 - 64 Morning Mist
 - 65 "Out Beyond the Sunset Could I But Find the Way."—
John Masefield
- KILMER, T. W. (New York City)
 - 66 Portrait of Pirie MacDonald
 - 67 Richard Abbott as Abraham
 - 68 Portrait of Mr. R.
- KOCH, ROBERT E. (New York City)
 - 69 Chess Board—An Example of Handmade Marquetry, Containing
8260 Pieces of Wood
- LARRABEE, RALPH C. (Boston)
 - 70 September Hay
 - 71 Scrub Pines
- LAVANDERA, MIGUEL (New York City)
 - 72 A Panama Hat
- LEVINE, GEORGE G. (New York City)
 - 73 Santa Maria
- LILIENTHAL, HOWARD (New York City)
 - 74 Charge
- LYNN, ETHEL (Mrs. Harlo Lynn) (San Francisco)
 - 75 A California Giant
 - 76 Desert Sunset
- MALONEY, DANIEL J. (Waterbury, Conn.)
 - 77 Southington Mountain
- MARTINETTI, C. D. (Orange, N. J.)
 - 78 Sand Dunes
 - 79 Evening
- McCREADY, JAMES A. (New York City)
 - 80 Sylvan Stream in Afterglow

81 Sycamores in Sunlight

82 Beethoven

MINSKY, HENRY (New York City)

83 Fundus

84 Fundus

MOSSMAN, JAMES (New York City)

85 Portrait (Plaster)

86 Thunder on the Right

87 October Hills

88 Burton's Farm

89 Red Boat-House

90 Balsams

90A Approaching Rain

NILSEN, ARTHUR (New York City)

91 Drifting In

92 Portrait—"Alexander Popini"

93 Portrait—"Sir St. Clair Thomson"

OASTLER, FRANK R. (New York City)

94 Dall Ram

95 California Redwoods

96 Gulf of Alaska

PATTERSON, HENRY S. (New York City)

97 Dawn, Eastport

98 Autumn in Ramapo Hills

99 Boblainey Wood, Invernes

PIERCE, GEORGE HOWARD (New York City)

100 Beyond the Horizon

101 The Approaching Storm

SCHROEDER, LOUIS C. (New York City)

102 Portrait Bust of Boy

SMITH, ALONZO DeG. (New York City)

103 North African

104 Old Man Grey

STRONG, A. McL. (New York City)

105 South Sea Beach

TARTAKOW, I. J. (New York City)

106 Bookplate: "The Talmudist"

107 Charcoal Study of an Infant

WIENER, RICHARD E. (Florence, Italy)

108 Still Life

109 Asters

110 Peonies (Loaned by Mr. and Mrs. S. M. Lehman)

111 Fruit and Flowers

WIGHTMAN, ORRIN S. (New York City)

112 Six Portraits

WOGLOM, WILLIAM H. (New York City)

- 113 William
- 114 The River

WOLFE, BERAN W. (New York City)

- 115 Pensive Head
- 116 Mask
- 117 Head of a Young Girl
- 118 The Psychiatrist (Drypoint)
- 119 The Danube (Etching and aquatint)

WOLF, MAX (New York City)

- 120 Act (Oil Sketch)
- 121 Etchings
- 122 Etchings

McKENZIE, R. TAIT (Philadelphia)

- 123 Tortoise Doorknocker

MOSHER, HARRIS P. (Boston)

- 124 The Mooring
- 125 Bunker Hill
- 126 The Floyd Ireson House, Marblehead

NOTICE

Beginning in February the meetings of the Society for Experimental Biology and Medicine will be held under the auspices of The New York Academy of Medicine.

DEATHS OF FELLOWS OF THE ACADEMY

VICTOR HUGO JACKSON, M.D., 57 West 57th Street, New York City; graduated in medicine from the University of Michigan, Ann Arbor, Michigan, in 1878; elected a Fellow of the Academy April 6, 1893; died, January 26, 1929. Dr. Jackson was a Fellow of the American Medical Association and a member of the National Tuberculosis Association.

WALTER BARRY JENNINGS, M.D., Connecticut State Hospital, Middletown, Connecticut; graduated in medicine from New York University, New York City, in 1898; elected a Fellow of the Academy February 1, 1906; died, January 21, 1929. Dr. Jennings was a Fellow of the American Medical Association, a member of the American Psychiatric Association and of the Connecticut State Medical Society.

JOSEPH RANKIN LOSEE, M.D., 114 East 54th Street, New York City; graduated in medicine from the Long Island College Hospital Medical College, Brooklyn, New York, in 1907; elected a Fellow of the Academy February 1, 1917; died, February 4, 1929. Dr. Losee was a Fellow of the American Medical Association, Pathologist and Medical Executive Officer of the Polyclinic Medical School and Hospital, and Pathologist to the Lying-in Hospital, New York.

FREDERICK SAMUEL LOVELL, M.D., 31 West 74th Street, New York City; graduated in medicine from New York University, New York City, in 1886; elected a Fellow of the Academy November 2, 1911; died February 7, 1929. Dr. Lovell was a Fellow of the American Medical Association, Rhinologist and Laryngologist to the Polyclinic Medical School and Hospital, Consulting Surgeon to the Bronx Eye and Ear Hospital and Consulting Nose and Throat Surgeon to St. Catherine's Hospital.

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EDITORIAL

MEDICINE AS AN AGENCY IN THE ADVANCEMENT OF SCIENCE, ART AND CIVILIZATION ¹

It is agreed by most recent thinkers that apart from disease, injury or unforeseen disaster, the main source of dissatisfaction with life is to be sought in some sort of mental or spiritual conflict, which as Aristotle noted long ago, is the leading motive in the human tragedy. Orestes, *Cedipus*, Hamlet, Don Quixote, Faust, Tristan, Wotan, Hernani, Julian Sorel, Anna Karenina, all illustrate this internecine warfare between the natural human and the hidden *alter ego*, of which the Freudian or Adlerian interpretation is accepted as profound in so far as it is reasonably true to human nature, in other words, not made too universal or too exclusively sexual in application. One of the most familiar forms of the proposition is the biological theorem: Adaptation to environment spells survival, if not success; failure or inability to adapt means conflict, defeat, extinction, or in plain English, to go out of business. This, in Tilney's reading, goes back to the initial struggle of the primeval anthropoid to emancipate himself from the status of an instinctive lower animal to that of a rational cerebrating being, by development of the anterior lobes at the expense of the brain-stem. But, in the ordinary relations of life, the generalization seems a bit glittering, since, apart from unavoidable disease or disaster, most people do adapt themselves to environment in the long run or else get out of it when unsuitable (the

¹ Substance of a lecture read at the Mayo Clinic (November 16, 1928) and elsewhere.

index of strength), if not compelled to get out of it by their fellows (the sign of weakness). Apart from the solutions proposed by such great religious systems as Buddhism or Christianity, a simple and lucid statement of the problem was made by the Greek philosopher Heraclitus, when he said that, "Though reason is accessible to all, most people, it seems, incline to live according to their own notions."² This sounds trite, yet is deeper than might at first sight appear. Its breadth and depth may, in fact, be gauged by contrasting the very first sentences in Emerson's Essays—

"There is one mind common to all individual men. Every man is an inlet to the same and to all of the same. He that is once admitted to the right of reason has been made a freeman of the whole estate."

With a "mighty line" of the Elizabethan dramatist Marston—

"The greatest misery of man is doubt."

For the sense of this Heraclitean saw, once we get its drift, is this: Whatever his whims, fancies, notions or impulses to action, even the most primitive savage is already on the road to constructive thought when he senses the existence of certain laws controlling himself and his environment, which, if understood, will, in turn, give him that lordship over things, which is science, or in his own terminology, "magic." In wild nature or the jungle, man was literally "up against it," overwhelmed by hostile forces stronger than himself, like soldiers gassed or shell-shocked at the front. The law of his being in such situations was that species of decerebration or "cold feet" which the Greeks labelled *panikos phobos* or "Panic Fear" (Myres). To look into the face of the Great God Pan was, for the Greeks, a sign of impending death; and perhaps it is because one is advancing in years that we had our first fleeting glimpses of him in the Far East. One glimpse was afforded in the singular hysteria of some primitive Tagalogs when confronted by the possibility of a swift rapid incision (under carbonic acid snow) to let out pus from

² Cited by Myres in: *Science and Civilization*, Oxford, 1923, 8.

a superficial abscess. Another was the tendency of lepers and wounded savages to hide in the jungle or other secret places rather than undergo treatment in hospital; another was the instinctive and apparently beneficial use of opium by the races given to running amok or *juramentado* in that devastating humid heat. Steaming into Canton on a stifling, stuffy morning, I remarked upon the frantic runnings to and fro of coolies pulling rickshaws along the *Bund*, their eyebrows slanted into a veritable zigzag, a *Treppe* or "staircase phenomenon." As the stolid English captain remarked, they might well bestir themselves, for failing the few copper coins it was up to them to gain, there was nothing for it but to go hungry for days at a stretch, with the common sequel of suicide or murder. In the jungle, then, whether of the hinterland or of a large city, the primitif encounters just what Roosevelt said that government should not do: he finds the cards stacked against him. The almost senseless fecundity of nature in the tropics, the incontinent swarming of insects, reptiles and plant life at sudden intervals, is apt to overwhelm and stupefy even the sophisticated indweller of more temperate climes at the start, when he is not used to it. The reactions of prehistoric man to disease, injury, or impending death from hemorrhage, suffocation or physical violence, were, in Sudhoff's reading, of the same type: "What and whence this undecipherable thing which thus assails us?" Now there is this about anxiety or worry that, if once allayed, it leads to that line of least resistance known as Maupertuis' Principle, expressed by a droll army file of my acquaintance as follows: If anything gets into a hole, it tries to get out of that hole with as little trouble to itself as possible. In other words, the initial reaction of the mind, when overwhelmed by something unknown or unthinkable, is not a vigorous offensive, but that purely defensive strategy which, in warfare, as Myres says, "often spells disaster." When the mind begins to cast about for offensive measures, say even those of primitive magic or "making medicine," it is already on the road to science; and it is man's natural conceit of himself with regard to

the infallibility of science or of his notion of it, which the old philosopher regarded as his principal handicap in coping with the hostile forces of nature. Timidity and temerity, fear and self-conceit are man's worst enemies. This is what Heraclitus meant when he said that most people incline to live according to their own notions, even where reason is possible and accessible.

Now what has all this to do, you may ask, with the theme of this paper? It has everything to do with it. For directly man climbs out of the nomadic state into the pastoral, he proceeds to domesticate the wheat, the barley, the plants, the animals, his family, his fellows and even the water about him. In the wild state, his marital and domestic status was that of the poor Indian of the Amazon forests, who, like the roving Englishman in Grenville Murray's story, "had a wife cruising around somewhere;" "I had a wife once but I don't know where she is now; the children went off and I lost her; she is hunting somewhere, like me." Domestication is the first step toward civilization, *i.e.*, the kind of *Kultur* which springs up among civilians in cities; and with domestication, the doctor of medicine begins to emerge from the chrysalis of the mere charlatan or medicine man.

Wherever man settles for a pastoral or civic existence, he instinctively seeks the neighborhood of inland seas or other watersides, for commercial and agricultural purposes. What Myres calls domestication of water,³ was thus the essential factor in the civilizations of Egypt, of Assyro-Babylonia, called the Land between the Rivers, and of Crete, which may be said to have domesticated even the Ægean Sea, with reference to harbors, shipping and marine zoology. In Egypt and Assyro-Babylonia, those great "riparian states," virtually founded upon burning sands and mudflats, man is thus, for the first time, not overwhelmed by the hostile forces around and about him, but actually in position to tame them and make them work for him. Through the fundamental achievement of these

³ Myres: *op. cit.*, 26-35.

great river-valley cultures (domestication of water), it was possible to irrigate the great wheat-fields of the Mesopotamian plain, which were fought over by grasping rivals for thousands of years; to effect astronomical calculations, to apply the geometric idea of mensuration to such things as time, partition of land, the adjustment of taxes, fines for criminal offenses, the paving of streets, estimation of the cubic content of great sewers and drains; while records were preserved in arrow-shaped characters on queer shredded wheat tablets of baked clay. In the Nile Valley, similar developments go back to an even remoter period and survive for an even greater stretch of time. The old prehistoric trait of making pictures on walls, true repositories of records preserved in queer picture writing; the ramshackle pantheon of gods with heads like those of domesticated animals, the chipped flint knives, the peculiar evolution of baked clay pottery and of sculpture, all point to emergence from the stone-age. Egyptian civilization may go back as far as 13000-15000 B. C. The extraordinary feats of engineering implicit in the great columns, pyramids and temples, the dignified, stately sculpture, the many creature comforts and luxuries of the New Empire, all indicate a civilization as elaborate and highly specialized as our own. Most of the papyric texts give us Egyptian medicine in its decadent or sleepy pear phase. The oldest known, the Smith Papyrus (1600 B. C.) suggests that Egyptian surgery may actually improve as we move backwards in time. The phase outlined by Herodotus (450 B. C.), a doctor for every disease, is that of a very late period of extreme specialization, not unlike the medicine of the present hour. On the other hand, the many different statuettes of Im-hotep, the father of Egyptian medicine (4500 B. C.), go back to a phase of medicine in which, as in our own country, the doctor becomes a prominent government official on occasion, and that period may be late or early. Im-hotep held four cabinet portfolios, which somehow suggests Benjamin Rush, Hubert Work, Sir Michael Foster, Lord Ilkeston, Lord Dawson of Penn, Virchow or the 274 American physicians who served in

Congress between 1789 and 1910. In the palmy days of Egyptian medicine, the physician was already a personage of great credit and renown. The phase of Babylonian medicine which Herodotus describes—"the whole people as physician"—indicates also a very late period, namely, socialized medicine, a very dubious phase, to which we ourselves may be tending. In the Code Hamurabi, the Babylonian physician of 2250 B. C. was definitely protected as to fees but rigorously punished for malpractice. By 650 B. C., he was in one instance, a family counselor of royalty. His status in a world of medical specialists of obviously not as high as among the medical specialists of Egypt, and this is also startlingly modern and worthy of some attempt at elucidation. Both these great riverside cultures, Egypt and Babylon, managed to persist longer than any others known and by a process which Myres describes as not unlike that by which the Eastern Roman Empire (Byzantium) held its own for a thousand years after the fall of the West. In all three, as in China, the intelligentsia or intellectual aristocracy, who were the sources of knowledge and the agents of power, as being the brightest and keenest minds in their class, gradually merged into oligarchies or autocracies, the watch-words of which were "hush—hush and *verboten*." The results were complete suppression of mental freedom, complete sterilization of original thought and investigation, complete social control or virtual enslavement of the individual unit. The Egypt, Babylon, China and Byzantium that we know were cold storage plants of knowledge acquired in the past. The religious system of Egypt, like that of the Middle Ages, was concentrated more upon the world beyond the grave than upon actuality. The Babylonian system, like that of present Soviet Russia, saw death as practically the end of all. Yet the artists of both Egypt and Babylon were remarkable descriptive biologists and experts in human constitutional anatomy, as witness the wounded lions of the Assyro-Babylonian bas-reliefs; the depiction of bearded barley (*Hordeum spontaneum*, the earliest known plant) on an Egyptian tomb (first

dynasty) at Abydos; the Sumerian boundary stone (1185 B. C.) which already presents the signs of the zodiac; the Egyptian carvings of mules, horned cattle, gazelles and pelicans on slate or ivory; the massive, realistic portrayal of ethnic types in Egyptian and Assyro-Babylonian sculpture and the more sophisticated flappers, society girls and acrobatic dancers of later Egyptian art. Comparable with the Smith and Ebers papyri are the Assyrian medical texts and herbal assembled by R. C. Thompson (London, 1926). But the clinical medicine of the Ebers Papyrus, while abounding in prescriptions employing apothecaries' weights and measures, reveals no such *flair* in diagnosis as is to be found in the surgery of the Smith Papyrus; and in Assyro-Babylonian medicine, ætiology was mythology, diagnosis was mainly guess-work, prognosis was hepatoscopy, astrology and omen-lore, therapeutics was exorcism with herbals and *Dreck-apotheke*, prophylaxis was incantation and even epilepsy and arthritis deformans were envisaged as seizure by demons.

In Greece, what a change! Clinical or bedside medicine becomes scientific in method, although, except in the mathematics, the Greeks neither verified premises nor subjected conclusions to a rigorous scientific proof. The animals and plants depicted on Cretan wine-cups and bas-reliefs, on Greek coins, vases and friezes are identifiable as to genera and species and still to be found along the Ægean and Ionian littoral. The Greek name for a painter (*zoographos*) implies a descriptive zoologist; and this tendency, whereby the physician assimilates an aptitude for close observation from the artist, culminates in the *Rhizotomikon* of Crateuas, the *Historia animalium* of Aristotle, the Botany (*Historia plantarum*) of Theophrastus and the *Materia Medica* of Dioscorides. In Theophrastus and Aristotle, the *tribe meta logou* or clinicals method of Hippocrates⁴ (first grub for facts, then reason about them, to get at the essential law behind them) by),

⁴ See Dr. Howard A. Kelly's Hunterian Oration (1928).

comes the mode of reasoning and mental discipline employed in all the other natural (biological) sciences. Hippocratic surgery is aseptic in intention at least, and by Galen's time, medicine is theoretically based upon anatomy and physiology. Hippocrates appears in Plato as a highly individualized being of original mind and independent personality. Galen, physician to one of the great Antonine emperors and the first great experimental physiologist before Harvey, adopts the Roman law-makers' habit of codifying and systematizing knowledge, sets the pace for the great medical encyclopædias of the Byzantine, Arabian and mediaeval periods and, through his mania for seeking the "why" rather than the "how," sterilizes the medicine of the West for nearly 1700 years. In consequence, mediaeval clinical medicine, and with it the social status of the doctor, sink to what Allbutt styles "an almost unexampled degradation." Up to the time of Leonardo and Vesalius, anatomy and physiology are virtually nonexistent. Military surgery is developed, as with the Greeks and Romans, through the exigencies of constant warfare; and public hygiene through the devastating mortality and social inconvenience of the great epidemics. Apart from the temporary social status or political power of the physician, what, then, is the role of medicine as a civilizing medium in classical antiquity and the Middle Ages? It is perhaps implied in the Hippocratic phrase "*non nocere*," whereby, in a world notable for the destruction of life by warfare, by the bizarre impulses of military or political tyranny, or the homicidal force of swift descending epidemics, before which collective humanity is powerless, the doctor appears for the first time as the one social unit who is neither indifferent to nor stupefied by these forces, but actually sets his will, his mind and his knowledge up against them. As Singer states,⁵ the spirit of the antique world, like that of wild nature, was nowise sympathetic or considerate of human suffering, bodily weakness or deformity, personal misfortune or social disability. "While other animals have an instinctive knowledge of their own

th. Singer: *From Magic to Science*, London, 1928, 13.

powers" (he cites from Galen), "only man is helpless without instruction. He alone desires honors and possessions, he alone provides for his grave and even for his future after death. All other animals live at peace with their kind, but with man, verily, most of his misfortunes are the doings of his fellows." And thus Plautus: "Man is the wolf of man (*homo homini lupus*), nay a man is regarded as no more than of the nature of vermin by a stranger who does not know him." *Vae victis* was the law of the antique world. Whole populations were put to the sword on occasion; but ancient humanity was no worse than its successors in some important respects. To realize the enormous amount of meaningless bloodshed through the ages, read Quanter's History of Torture or Winwood Reade on the Martyrdom of Man. Through all this long, gloomy recital, medicine emerges in the background as an impersonal, undemonstrative, not overly enthusiastic friend of humanity, and as sometimes happens in actual life, such friends may turn out to be more helpful and reliable than the kind who affect great heartiness of manner, are voluble in expressions of regard, and incline to make a great flourish of concern about the other fellow's welfare. It is perhaps through this very impersonal attitude that medicine was at length able to accomplish something for humanity. In antiquity, for example, the wounded common soldier received no aid whatever on the field of battle, could only crawl to shelter when maimed, and usually bled to death. Army surgeons existed only for the benefit of the particular overlords of whom they happened to be vassals. But in the 16th century, Ambroïse Paré, who sprang from the people himself and made his way to the front through his own industry and ability, takes the novel republican line of occasionally helping the common soldier. All his worry about pouring boiling oil into wounds, or transmission of infection by flies, sprang from concern about the sufferings of the rank and file of his wounded.

Meanwhile as far back as the battle of Laupen (1339), the cantons of the little Swiss Confederation, already vir-

tually a republic, had begun to appropriate definite money to insure the proper humane care of the wounded;⁶ and by the 18th century, first France, and then other countries, began to print military orders and regulations on official paper, as public documents, notifying the wounded soldier, who risks life and limb for his country, that his government is definitely behind him in the enterprise and engages, in honor, to look after his welfare on the field of battle. Even through the Crimean War, the Moslems and the Turks continued to pile their wounded in heaps and rows, and then desert them, as being cheaper administration, albeit glossed over by the somewhat pretentious fatalism of Islam.

As an agency in the advancement of science, medicine seems to become remarkably prominent and efficient in periods of great intellectual fermentation, such as the Periclean, the Renaissance, or the post-Napoleonic, but in more quiescent periods, such as the 17th century or the Victorian era, medicine itself is very materially forwarded by scientists and the rest of the non-medical.

In antiquity, Aristotle, Theophrastus and Dioscorides, physicians all, did most for natural history (botany and zoology) and even geology and palæontology find their literary origins in the *Meteors* of the Stagirite. In the Middle Ages, Avicenna was the first to attempt an exposition of the origin of mountains; but apart from the work of miniature painters in the illuminated manuscripts and Books of Hours, culminating in the great *Horae* of Jean de Bourdichon (1508), the leading naturalists were Albertus Magnus (a Dominican), Thomas of Cantipré and Roger Bacon (a Franciscan). With the Renaissance, however, descriptive botany and zoology were cultivated at first hand as independent sciences, and this advancement was again the work of physicians. In the matter of botany alone, one has only to think of the German Fathers (Brunfels, Fuchs, Bock, Cordus); of the Italians Cesalpino, Della Porta, Brassavola, Mattioli, Bonafede, Leoniceno and Anguillara; of the Frenchmen Ruelle, Clusius, Belon and Lespleigny; of the Englishmen Turner and Gerard; of the Spaniards Oviedo and Monardes, the Swiss Gesner and the Belgian Dodoens. Among the medical zoologists are Conrad Gesner, Aldrovandi, Fabricius, Casserius, Carlo Ruini, Edward Wotton and Volcher Coiter, the founder of comparative anatomy. Palæontology (fossil remains) was studied by Fracastorius,

⁶ C. Brunner: *Die Verwundeten in den Kriegen der alten Eidgenossen-schaft*. Tübingen, 1903.

and the first treatise on mining (*De re metallica*) by George Agricola (1556), the "father of mineralogy," later translated by Herbert Hoover (1912), was the work of a physician. In the mathematics, Fernel made the first exact measurement of a meridian, (1528); Cardan wrote an algebra (1545) containing the (Tartaglia) method of solving cubic equations associated with his name; and Robert Recorde, the first English writer on arithmetic, algebra and astronomy, introduced the plus, minus and equality signs. Many of the earlier school arithmetics were also written by doctors, notably those of Johan Widman (1488), Giorgio Valla (1501), Arnold of Villanova (1501), Jean Fernel (1528), Georg Agricola (1533), Geronimo Cardan (1539), Gemma Frisius (1540), Robert Recorde (1542) and Michael Neander (1555). Horoscopes and almanacs containing astronomical computations (e.g., those of Regiomontanus) were usually the work of physicians. Galileo had studied medicine and Copernicus was a medical graduate. The chemical tradition, established by Paracelsus, came to a focus in the first formal text-book on chemistry, the *Alchymia* (1595) of the physician Andreas Libavius, and was continued in the 17th century by John Mayow, Van Helmont, Franciscus Sylvius, Robert Boyle, Minderer, Lemery and Mynsicht. Geology and mineralogy were advanced by Stensen, who discovered fossil remains and founded stratigraphic geology (1669) and by Bartholinus, who discovered double refraction in Iceland spar (1670). The year 1600 is memorable for the publication of the great treatise on magnetism (*De magnete*) by William Gilbert, physician to Queen Elizabeth and James I. The botanical tradition is maintained by such 17th century physicians as Hooke, Grew, John Ray, Rivinus, Tournefort and Camerarius; the zoological by Swammerdam, Malpighi, Severinus, Martin Lister, Edward Tyson, Wormius, Vallisneri and Redi. In the 18th century, medicine claims among the botanists, Linnaeus, one of the greatest naturalists of all time, as well as the Jussieus, the Saussures, Boissier de Sauvages, de Candolle, Haller, Adamson, Pallas and Trembley; among the zoologists and comparative anatomists, Buffon, Vicq d'Azyr, Bonnet, Erasmus Darwin, Geoffroy Saint-Hilaire, J. J. Meckel; among the chemists and mineralogists, Black, Boerhaave, Dalton, Scheele, Berzelius, Wollaston and Davy; among the physicists, Young, John and Daniel Bernouilli, Galvani, Oersted, Fahrenheit, Réaumur and the astronomer Olbers. Some thirty plants were named after American medical botanists of the 18th and 19th centuries, and we need only mention such moderns as Pfeffer, de Vries, Ferdinand Cohn, Sprengel, Treviranus, Rudolphi, Mohl, Robert Brown, S. F. Gray, Asa Gray, Jacob Bigelow, in evidence of the continued fostering of this science by medical men, from Theophrastus to Tschirch. In zoology, Johannes Müller, von Baer, Huxley, Kölliker, Henle, Haeckel, Fritz Müller, Weismann, Milne-Edwards, Roux, Driesch, Gegenbaur, Wiedersheim, Duméril, Lacépède, Rudolphi, Siebold, Küchenmeister, Leuckart, and Leidy uphold the same tradition; in geology and palæontology, Parkinson, Murchison, Huxley, Agassiz, Leidy, Gibbs, Newberry and the Leontes; in chemistry, Dumas, Wöhler, Chevreul, Berthelot, Berthollet, Bourquelot, Bunge, Frerichs, Hoppe-Seyler, Abderhalden, Buchner, Ehrlich and the Drapers.

In physics, Helmholtz is one of the greatest names, and Robert Mayer, Sainte Claire Deville, Dulong, the Weber brothers, Poiseulle, du Bois Reymond, Brücke, Mach, Flick, Vierordt and Ludwig were all medical graduates, as were the psychologists Lotze, Wundt, Fechner, Hering, Romanes, Preyer, Donders, Binet, Janet, Freud, Adler, Pavloff, Munsterburg, Jung, Stekel, Boas and Scripture.

In classical antiquity, as stated, the physician bore and maintained only an oblique, casual, detached, impersonal relation to the advancement of civilization, as Pericles sensed the term in his famous oration, *viz.*, when life is so arranged that the civilian in cities does not bear arms against or otherwise make war upon his neighbor but is inclined to coöperate with him and help him. In the antique world, as throughout the Middle Ages and down to about 1850, there was a constant stream of evil spoken of physicians, in the way of satirical allusions to their failure to cure, their frequent losses of patients, their love of money. But where the doctor seemed to kill rather than to cure, where some acquired a reputation for filling graveyards, it was plainly due in most cases not to malice aforethought, but to ignorance, incompetence or to that overweening conceit as to his own powers which Heraclitus regarded as one of the most formidable enemies of man. No matter what bizarre medical theories obtained in any period, the greater physicians, as Dr. Welch has pointed out, somehow got their patients well and their reputations, their wealth, their extensive clientèles were obviously due to that fact. How did they manage it? Principally, one might surmise, by the kind of personal care and attention (*curare*) which is equivalent to good nursing; by the use of simple remedies; and above all by adherence to the Hippocratic precept *non nocere*, to do no harm if you can do no good. "Natural forces within us," said Hippocrates, "are the true healers of disease." This ultimate reliance upon the defensive mechanisms of the body, the equivalent of Ambroïse Paré's "I dressed him: God healed him," has characterized all the greatest healers of disease and injury.

The big thing about the doctor is this: while he holds the keys of life and death in his hands and might virtually

assassinate patients by intentional malpractice or neglect, the test and touchstone of a true physician is that he never does, and that has been his principal contribution to civilization. In armies, the doctor has sometimes had a hard time of it and was looked upon as a kind of anomaly in the military scheme of things, which he, in fact is, since his essential function is to save rather than to slay. But without evacuation and proper care of the wounded, the fighting lines become demoralized, as Livy has so vividly shown in his Roman History. The Napoleonic wars, as well as the World War, have shown conclusively that the most gigantic armies will melt away to nothingness in time, unless there be constant salvage of sick and wounded personnel. The true functions of the medical officer, apart from the sanitary aim of keeping his organization in good health, is therefore, helping to maintain the defenses of his country, including the winning of victories in battle, by salvage of personnel. Thus the fundamental aims of general medicine and of military medicine are identical. The slow development of this basic ideal of salvage of personnel, out of the primitive Ishmaelite code of *homo homini lupus* and "beggar my neighbor," is delineated with broad strokes in the fifth book of Lucretius (1011-1027):

"Next, when they had got them huts and skins and fire and woman was appropriately mated to one man, and the laws of wedlock became known and they saw offspring born of them, then first mankind begun to soften. For the fire saw to it that their shivering bodies were less able to endure cold under the canopy of heaven and Venus sapped their strength and children easily broke their parents' proud spirit by coaxing. Then also neighbors began eagerly to join in a league of friendship amongst themselves to do no hurt and suffer no violence, and asked protection for their children and womankind, signifying by voice and gesture, with stammering tongue, that it was right for all to pity the weak. Nevertheless concord could not altogether be established, but a good part, nay the most part, kept the covenant in good faith or else the race of mankind would even then have been completely destroyed, nor would birth and begetting have availed to prolong their posterity."

It is hardly necessary to repeat that this Lucretian citation actually depicts the evolution of civilization, i.e.,

the advancement of mankind out of the savage, nomadic, predatory status up to a more secure and coöperative social organization, which favors and is conditioned by the development of science and art. It is equally apparent that this life-saving and life-enhancing function of civilization is identical with that of medicine; and that wherever the healing function of medicine and the safe-guarding role of hygiene are developed and maintained at high levels, there also will civilization maintain itself at a level correspondingly high. The role of medicine in this relation is, however, impersonal, disengaged, disinterested, like that of the sunlight or radium or other phases of *milde Macht* in therapy. Accepting, provisionally, Goethe's device for the development of civilized people—

“Wer Wissenschaft und Kunst besitzt.
Der hat Religion.
Wer keine von den Beiden hat,
Der habe Religion”—

it may be affirmed that medicine, and science in general, lose caste, become inept and ineffectual when they attempt to take over or to obliterate the functions of religion, for the simple reason that, being illiberal, the aim is neither necessary nor desirable. Religion implies an emotional obligation or attachment to modes of belief regarding the spiritual, the supermundane, the supersensual, as in Christianity, or to a definite ethical code, as in Buddhism or Judaism. Scientific men, at best, may hold opinions only and these lightly, since hobby-riding in science connotes bigotry, conceit, pedantry or fanaticism. The very essence of the scientific attitude is capacity of the mind to change and adapt itself to new discoveries. People endowed with religious natures, however, are, in the very meaning of the term, wedded to convictions which, at one extreme, may result in bigotry or fanaticism, but at the other, have been most potent agencies for the development of personal nobility, ethical refinement and strength of character. Here, then, are two essentially different worlds of thought, of feeling, of approach to the problems of the universe, concerning which Virchow meant no flippancy when he

affirmed that they should be kept apart and do, in fact, mutually exclude each other: *Die Wissenschaft und der Glaube schliessen sich aus.*⁷ Indeed, Claude Bernard deliberately advised the scientific man of religious temperament to shed his temperament when at his scientific employ, in order to "modify and change his ideas as science advances." Religious belief, then, implies emotion, conviction, fixation, tenacity of purpose, but, like Oliver Herford's bridal chamber, the purely intellectual *milieu* of science must be spacious enough to change one's mind in. With these fundamental antagonisms, medicine proper has little, if anything to do. Its role in the advancement of civilization is implicit in the Hippocratic sentence: "Wherever the art of medicine is loved, there also is love for humanity." As we shall see, the exploitation of medicine as a social force, adumbrated by Descartes and first definitely outlined by Virchow (1849), did not become a matter of special moment until after the World War, and then largely through confusion of the fundamental aims of bedside medicine (to cure disease or injury already acquired or incurred) with those of public hygiene (to prevent disease or injury beforehand). As long as and whenever people are sick or ailing, wounded or suffering, mentally or morally unhappy, medicine must remain eternally medicine.

Between the Renaissance and the 18th century, the physician rose steadily in social consideration and in some instances, in political power, but the men who illustrate

⁷ A fair notion of the attitude of the scientific man may be gleaned from the viewpoint of Huxley, or the admissions of Professor Ostwald in "Individuality and Immortality" (Boston, 1906, 5, 36-38) that "It is only the inanimate part of the world which concerns him scientifically, and any ideas he may hold about the question of immortality are his private opinions and quite independent of his science. . . . Religious beliefs and similar sources are limited to the number of men giving them credence . . . and can only be accepted by those who have passed through the inner experience and had the truth revealed to them by intuition." But "such predictions as are indorsed by science are . . . as the most reliable ones by the intelligent majority of men." *West. Med. Tim.*

our thesis best are such as the quiet Linacre, the friend and physician of Erasmus and the "restorer of learning in England," or the physician-astronomers, Fernel and Copernicus, or such lucid spirits as Malpighi, Redi, Baglivi, Sydenham, Cheselden, Pott, Mayow, Linnaeus, Boerhaave, Haller, Peter Frank, Cruikshank, Young, Auenbrugger, Fothergill, Pringle, Lind, Heberden and Jenner. Bearing in mind the vast social influence of the clergy through the centuries, it would be absurd to see these great physicians as other than essential prime-movers of civilization.

In the 18th century, the physician enjoyed a unique social consideration unmatched in any other period. As the private counsellor of patients, he knew all the family secrets and skeletons, he knew all about every person in his village and people took off their hats to him. Many of the prominent physicians of the period, such as Garth, Arbuthnot, Blackmore, Akenside, Haller and Werlhof, were poets and men of letters, a tradition which has continued unbroken down to the present time. All the greater English physicians named had unique political influence. Sloane was president of the Royal Society and Radcliffe, a less scrupulous man, held both the Whigs and the Tories in his grasp, so that "the two factions of the aristocracy bowed before him." Garth, Sloane, John Hunter, Percival Pott, Jenner and Richard Brocklesby were probably the most charitable physicians in the history of medicine; William Hunter, Fothergill, and Lettsom among the most munificent in public benefactions. Young stands quite apart as one of the greatest physicists and scientific men of all time. When, by consent of the National Assembly, Philippe Pinel struck off the chains of 49 patients at Bicêtre in 1798, he achieved one of the largest humanitarian advances of centuries, *viz.*, the sane and humane treatment of the insane. In the American Colonies, John Morgan and Shippen were the principal founders of the Medical Department of the University of Pennsylvania (1762) and later Surgeons-General in Washington's Army, while Rush wound ~~meant no his~~ Treasurer of the

United States Mint, which office he had held for fourteen years (1799-1813). In the long process of settlement of the country from coast to coast, the pioneer doctor often had to go over to farming or public office from sheer lack of patients in those thinly settled communities; but it is creditable that the *bona fide* physician got back into practice as soon as any was to be had worth having. During the 120 years between 1789 and 1910, no less than 274 physicians and 6 druggists served in Congress as members or senators, apart from 5 doctors who were elected but did not serve. The percentage from 1801 to 1838 amounted to a respectable fraction of both houses.⁸ From the time of Im-hotep, the first known physician, doctors seem to get into public service on occasion. Jacques Loeb affirmed that no legislative bodies of the future will be efficient without a fair quota of scientific men.

In the Napoleonic period and after, the physician of advanced type continues to enjoy the same high consideration at the hands of mankind. Corvisart and Larrey were esteemed by Napoleon, who despised medicine. As scientific men, Johannes Müller and Laennec, Schwann and von Baer are names to conjure with. Bright, Addison, Hodgkin, Parkinson and Hope in England, Graves, Stokes and Corrigan in Ireland, while not particularly known to the general run of medical students in their time, were recognized by the *cognoscenti* as topmost figures in pathology and clinical medicine. In the clinics of Chomel and Louis, the leading American physicians of New England and the East were trained. Eminent men like Sir Astley Cooper and Sir Benjamin Brodie in London, James Syme in Edinburgh, Daniel Drake in Cincinnati, began to take the same keen, human interest in the personal welfare of medical students which subsequently distinguished such great teachers as Johannes Müller, Carl Ludwig, Virchow, Pasteur, Osler and Welch. As readers of Albert Smith or of Du Maurier's Trilby will recall, medical students bore a hard reputation in these early days. If we con-

⁸ William Browning: *West. Med. Times*, Denver, 1919, xxxix, 39-47.

sider the pathos, the futility, the aimlessness of mis-directed youth, what it must mean to a young man to be actually led by a great master over the terrain and upward pathway of personal nobility, personal honor and distinction of personality, *si jeunesse savait, si vieillesse pouvait*, contacts of this kind must seem among the biggest and finest achievements in the history of our profession. Young people to-day, as we know, enter life in an entirely different spirit. They enjoy a freedom and spontaneity which we, who were trained in a more austere and rigorous school, never possessed and never dreamed of possessing. Naturally, one thinks, not of the life-enhancing present, but of the sombre and somewhat depressing past, shall we say the Cincinnati of Mrs. Trollope's "Domestic Manners of the Americans" or of the somewhat gloomy class and dissecting rooms of Washington when I was a medical student?

The period around the year 1850 was unquestionably the most brilliant in output and far-reaching in consequence in the whole history of medicine. I shall never forget the impressive way in which the late Dr. Jacobi described his sensations and reactions, the feeling of imminent, indefinable, impending change, the impact of an intellectual fermentation which culminated, for him at least, in the Revolution of 1848, his subsequent imprisonment and escape to America. Spoiled and bored as we are with such things as X-rays, long distance telephoning, radio, radium, the cinema, television, trans-oceanic aviation, salvarsan and insulin, should we feel like that to-day if the following events crowded one another in rapid succession?

1846: Ether anaesthesia (Morton).

Weber brothers discover inhibitory action of vagus nerve.

Claude Bernard discovers digestive function of pancreas.

Stokes describes heart-block.

Marion Sims improves gynaecology.

Kölliker describes smooth muscle.

- 1847: Helmholtz publishes tract on Conservation of Energy.
 Virchow's *Archiv* founded.
 Joule determines mechanical equivalent of heat.
 Simpson introduces chloroform anæsthesia.
 Donders elucidates movements of eyes.
 Ludwig invents kymograph.
 Gerlach introduces carmine staining.
 Young distils petroleum.
 American Medical Association and New York Academy of Medicine founded.
- 1848: Claude Bernard discovers glycogenic function of liver.
 du Bois Reymond investigates animal electricity.
 Helmholtz locates source of animal heat in muscles.
 Société de biologie (Paris) founded.
 American Association for the Advancement of Science founded.
- 1849: Claude Bernard's piqûre of the fourth ventricle.
 Marion Sims' operation for vesico-vaginal fistula.
 Addison describes suprarenal disease and pernicious anemia.
 James Thomson standardizes thermometry (absolute scale of temperature).
 Virchow appointed professor of pathology at Würzburg.
- 1850: Helmholtz measures velocity of nerve-current.
 Clausius demonstrates second law of thermodynamics.
 Waller states law of degeneration of spinal nerve-roots.
 Rayer and Davaine discover anthrax bacillus.
 Drake publishes *Diseases of the Mississippi Valley*.
 William Detmold (New York) opens abscess of brain.
 Lemuel Shattuck reports on backward condition of public health in Massachusetts.

By 1851, Helmholtz had invented the ophthalmoscope and medicine of scientific intention and achievement had already become a going concern. In this quinquennium, which Jacobi regarded as the most stirring in his whole existence, the outstanding figure was undoubtedly that of his old master Virchow, who, like himself, was an advanced liberal and, if not a revolutionist, the author of the most revolutionary pronouncement on medicine since the Hippocratic tract on the sacred disease.⁹ From his earlier flaming manifesto about the social causes of Silesian typhus epidemics up to his political duels with Bismarck or his anger over the Spanish-American War, Vir-

⁹ Virchow: *Die Einheitsbestrebungen in der wissenschaftlichen Medicin*, Berlin, 1849.

chow stands out as the first aggressive medical champion of humanitarian aims, wrong-headed in some ways, no doubt, but, with regard to his fragile physical envelope, a gallant little figure, his watchword, in fact, identical with that of the hero of Sartor Resartus: *Die Sache der Armen in Gottes und des Teufels Namen*. In 1849, he publishes his epoch-making pamphlet on unitarian aims in scientific medicine, which makes no particular splash at the time, but leaves its mark as effectively as the later agnostic pronouncements of Huxley. For to tenets such as these, published 80 years ago, the medical world has been coming back and will continue to come back as long as medicine remains medicine:

Physicians can only be called such when the ultimate aim of their labors is the healing of disease.

But once we have recognized that disease is naught else then the course of vital processes under altered conditions, the concept of healing expands to imply the maintenance or the reestablishment of the normal tenor of existence. Even in the hands of the greatest physicians, the practice of medicine is never identifiable with laboratory (experimental) medicine, but is only an application of it.

Physicians are the natural attorneys of the poor and no small part of social problems comes under their jurisdiction.

Belief begins where science leaves off and ends where science begins. The task of science is not to attack the objects of belief but to stake out the limits of the knowable and to center consciousness within them.

Humanism is neither atheistic nor pantheistic, since it has but one formula for things unknowable, namely: I do not know.

As Virchow grew older, he worried unduly about the fortunes of his solidist (cellular) scheme of pathology, then threatened by the rise of serology or other aspects of the spectre "humoralism"; and the end of his life found him, as his contemporaries noted, a liberal still in politics but a reactionary in science. His intellectual duel with the monist Haeckel took the fatalistic Moslem line of "Resignation" in the face of seemingly insoluble problems, some of them since shown to be sparingly soluble. In prefacing a translation of these polemics, Huxley humorously declared for "a strict policy of non-intervention." But in the history of the progress of humanitarian

liberalism in the 19th century, the name of Virchow will always be a bright particular star in the firmament. By contrast, his great contemporary Helmholtz remained inscrutable and impersonal with regard to questions of theologic, social or philosophic import, but left enthusiastic testimony as to the effect of medical training and the kind of reasoning which the physician employs upon individual capacity to cope with the problems of more abstract science. About Helmholtz, too, is the peculiar nimbus which invests the physician who is an actual, going practitioner of the fine arts—in his case, music. Aside from Athanasius Kircher, Felix Platter, Caspar Bartholin, Boerhaave, Auenbrugger, Withering and Arbuthnot, who were earlier followers of this cult, the profession numbers such remarkable musical amateurs and *maestri* as Carl Ludwig, Henle, Max Schultze, Billroth, Engelmann, Sir Richard Owen, Sir Robert Christison, Naunyn, Kahlbaum, Wilhelm Ebstein, Julius Jacobson, Ludimar Hermann, Duke Carl Theodor of Bavaria (ophthalmologist and composer of chamber music), Alfred de Bary, Borodin (composer of "Prince Igor"), Jacques Loeb, Arpad Gerster, Hecht, Herter and Hemmeter. Equally impressive is the list of talented medical artists, *e.g.*, John and Charles Bell, Richard Bright, Thomas Hodgkin, Jacob Henle, the elder His, Cruveilhier, Lord Lister, Joseph Leidy, Charcot, Auvert, Paul Richer, Lebert, Hope, Carswell, Sir Leonard Hill, Ramón y Cajal, not to mention hundreds of lesser known physicians who have excelled in drawing, painting, etching, engraving and modelling in the round. The recent exhibits of the artistic productions of Sir Leonard Hill and of local physicians at The New York Academy of Medicine and at Toronto in the same year (1927) were distinct revelations as to the latent potentialities of our profession in this regard. Yet it will be perceived at once that the vision of the artist and the physician's way of envisaging disease at the bedside (Charcot's "spontaneous mental approach *sans parti pris*") are one and the same. The list of medical poets, from Nikander to men like Lodge, Champion, Goldsmith, Schiller, Werlhoff Haller,

Keats, Beddoes, Littré, and latterly Holmes, Weir Mitchell, Kussmaul, Volkmann, Kraepelin, Sherrington, Henry Head and Robert Bridges; or of critics like Sainte Beuve, novelists like Smollett or Charles Lever, or dramatists like Echegaray or Arthur Schnitzler, is much too long to be considered here, but is what might be expected of the enterprising spirit and observant nature of the true physician. As we have seen, doctors have been the original prime-movers and continuators of botany, zoology, geology, paleontology and the rest of the so-called natural (biological) sciences and even in the mathematics and astronomy, such names as Copernicus, Young and Helmholtz give color to Huxley's claim that "medicine has been the foster mother of all the sciences." That the medical men who excelled in mathematics and music have been mainly physiologists is perhaps explicable by the fact that experimental physiology is itself an analytical (mathematical) science, turning, in the first instance, upon ability to count and measure,¹⁰ while diagnosis and general bedside reasoning are synthetic.

In exploration and the settlement of undeveloped continents and communities, physicians have ever been advance agents of civilization, nursing the population through the social ailments of political infancy and childhood up to adult self-dependence. In this phase, army surgeons, usually the first settlers, have had a prominent part and that part has been played well and manfully. Apart from ordnance surveys, the botany, zoology, geology, mineralogy, forestry, indeed the entire natural history of the gigantic peninsula of Hindustan, were worked out, in the first instance, by officers of the Indian Medical Service, and something of the same kind was accomplished by medical officers of the U. S. Army in some regions of the far West and, with reference to communicable diseases, in the Antilles and the Philippines. In recent times, physicians like Charcot, with his vast clinic of 5000 patients

¹⁰ The essentially mathematical nature of music was expounded by the great mathematician Sylvester (*Phil. Tr.*, Lond., 1864, cliv, 613.)

from all parts of the globe, Osler at Baltimore and Oxford or Ehrlich at Frankfort, acquire an ecumenical status, become physicians to the entire human race *in posse*, and what is more important, in spirit and *manière de voir*. There has been too, a kind of apostolic succession from great medical teachers like Rudolphi, Johannes Müller, Hyrtl, Carl Ludwig, Claude Bernard, Michael Foster, Charcot, Osler and Welch, who formed some of the ablest investigators, teachers and practitioners of recent times through that personal contact and personal touch, without which the student seems often to "eddy at large in blind uncertainty." A still higher function of medicine, as yet dimly realized, was clearly stated by Descartes: "If there is any possible way of increasing the wisdom and ability of mankind, it must be sought in medicine." This, the social function of medicine is, however, entirely different from socialized, or what now might be termed, Sovietized (*i.e.*, over-organized) medicine. One proposes to level humanity up to the outlook and attainment of scientific medicine; the other to level medicine down to average human comprehension. Either aim might be feasible enough with reference to instruction in personal (individual) hygiene, depending in each case, upon the mental capacity and degree of education of the individual; but neither aspect of this extremist program would benefit the bedridden sick or injured a particle. Medicine and hygiene start from the same point (maintenance of health) but, as Sudhoff has shown, their lines of approach and attack are entirely different. At the mathematical limit, they seem to fuse again in the ultimate ideal of military medicine, "salvage of personnel." With reference to the physical and moral damage done to humanity by wars and disease, the unattainable ideals of medicine and civilization become one and the same, as crystallized in the sonorous verses of Lucretius:

"Nec tamen omnimodis poterat concordia gigni,
Sed bona magnaue pars servabat fœdera caste;
Aut genus humanum jam tum foret omne peremptum
Nec potuisset adhuc perducere saecula propago."

F. H. GARRISON

THE SERUM TREATMENT AND ITS EVALUATION IN LOBAR PNEUMONIA *

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INTRODUCTION

The invitation to deliver this address is appreciated as a great honor. It is especially prized as it gives me an opportunity to acknowledge the great interest and support of Dr. Lewis K. Neff, Director of the Medical Service at Harlem Hospital, to express my appreciation for the inspiration, criticism and constant expert guidance of Dr. William H. Park, as well as the invaluable co-operation of my associate, Dr. Milton B. Rosenblith, and finally, to announce that the work described in this lecture has been fostered by the generous financial support and the personal encouragement of Mr. Lucius N. Littauer.

In the blood of patients who recover from pneumococcus pneumonia, there are usually demonstrable, protective substances against the type of organism which has invaded the patient. The development of these protective substances or antibodies is one of the mechanisms involved in recovery. The antibodies may develop in patients who die, but patients who fail to develop protective antibodies, do not recover. Serum treatment transfers to patients the protective antibodies made by horses in response to killed pneumococci.

The present day serum treatment of pneumonia presupposes an ultimate accurate knowledge of the organism invading the victim, and an available supply of concentrated serum of titrated protective value. There are refinements which increase the efficiency of the treatment,

* From the Littauer Pneumonia Fund of New York University, and the Medical Service, Harlem Hospital.

and make it more economical, which will be mentioned in the course of the presentation.

The diagnosis of the invading type is revealed by precipitation or agglutination typing tests. These are performed in the following way: the specific soluble substance or carbohydrate formed in the capsules of the organism, is agglutinated or precipitated with antisera from rabbits or horses.² These tests are performed on the extracted sputum (Krumwiede Test), on the peritoneal exudate obtained from a mouse after inoculating it with sputum (Avery), on organisms recovered (a) from the mouse's blood stream, by inoculating broth with its heart's blood when the peritoneal exudate is taken, or (b) from the blood stream of the patient. The tests may also be performed on specific soluble substance excreted in the urine, and on pus or organisms recovered from exudates. Occasionally, where no sputum has been obtained, it has been possible to recover a few organisms by aspirating the lung. In addition to these methods, a study of the rate of antibody¹ disappearance from the blood stream apparently may, at times, guide us in diagnosis, if when equal amounts of antibodies of two types are injected, one type disappears very rapidly. Of course, we must be sure that the organisms are Gram-positive diplococci, soluble in bile before typing them.

At times, a report of miscellaneous group invasion is made from one Laboratory, and of Types I, II or III, from another. This is disconcerting to the practitioner. One must be discriminating in interpreting any such difference. The report of a fixed type must be regarded as very strong evidence of the presence of that type. The test is so controlled that a positive report means that an emulsion of the organisms has precipitated with one test serum and failed to precipitate with the others. If precipitation

¹ In this lecture the word antibody is used though it is recognized that the agglutinin is measured. Antibody may be present when agglutinin is not.

² Since delivering this lecture the microscopic slide agglutination test has been developed and described by Sabin, from the Harlem Hospital service.

occurs in all or none of the tubes, the type is not determined, and the pneumococcus belongs to the miscellaneous group. Such a difference in reports may be produced, if only occasional tests are made, either by improper serum, serum improperly kept, or, in the case of cultures, by unsuitable media, or by insufficient inoculum for the mouse, by failure of the mouse peritoneum to digest the sputum and by the presence of other organisms which precipitate non-specifically. Sometimes the true type may be determined by diluting the culture or exudate in parallel with stock strains to titres of 1:60 or even 1/120, when the fixed type will be revealed by agglutinating in parallel with a stock culture. Miscellaneous group organisms will promptly fall out. On the other hand, there may be several types invading the patient simultaneously. On some occasions, organisms of Type I were obtained from the peritoneum and those of the miscellaneous group were found in the mouse heart's blood.

Miscellaneous organisms are frequently regarded as slightly virulent, and the discovery of them is thought to be of good omen. This is not always true, as some of the organisms are of great virulence, and invade the blood stream. Difference in reports may accordingly be due to failure to recognize a fixed type, or to simultaneous invasion of different types. Miss Alburta Brown, by careful study of our cases, at first typed with the routine methods mentioned as miscellaneous, found that 20 per cent of miscellaneous cases were actually infected by Type I or Type II.

The incidence of pneumonias by type has been studied by many. In our own cases, where the distribution is fairly typical, approximately 50 per cent of the cases are due to Type I and Type II, so that a polyvalent serum, containing Type I and Type II antibody, will be effective in half the cases. Type III occasions 13 per cent of cases. The miscellaneous group occasions, in different years, approximately 35 per cent to 45 per cent of all cases (see Fig. 1). We are justified in using polyvalent serum for

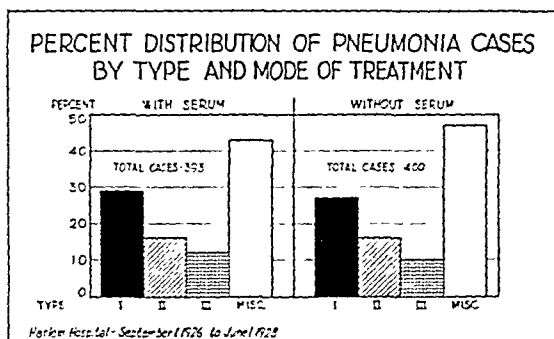


FIG. 1

some of the cases in which miscellaneous group is reported, because of the possibility of simultaneous infections with Type I or Type II, which cannot be revealed without time-consuming, intensive study of the sputum, blood and urine of the patient.

Occasionally, there is difficulty in obtaining sputum for typing. One should not delay giving serum in order to type the cases, nor should one be misled by a report of Group IV, as the positive demonstration of an organism of a definite type is of greater diagnostic value than failure to discover a fixed type by the methods employed. Polyvalent serum for Type I and II should be given at once, as these are the most prevalent types. It is improbable that the slight cross protection for Group IV organisms in the serum is of great therapeutic value.

From the miscellaneous or group IV, Dr. Park and Miss Cooper³ have isolated seven additional strains.⁴ They have also confirmed the existence of the two sub-types of II, originally isolated by Avery, our Type V and Type VI, and also a sub-type of Type III, our Type VIII. Thus there are now thirteen types and the miscellaneous group.

³ Cooper, Edwards and Rosenstein, *Journal of Experimental Medicine*, March, 1929 xlix, 461.

⁴ Miss Cooper has since segregated Type XIV from the Miscellaneous group.

One of these miscellaneous types, our present IV, originally isolated from the blood of a patient at Harlem Hospital, has been found in half the proportion of all patients as Type III, or 6 per cent. It is a virulent organism, killing more than one-third of its victims, and developing in horses, highly protective serum. It is widely distributed, being recognized by Griffith in England as his strain 10, and by Robinson for Pittsburgh as his IV B strain.

It is our purpose to attempt to prepare polyvalent serums for these additional types, in addition to serum for Type I and Type II, and to administer it to patients early in the course of the disease either alone or with polyvalent serum for Type I and Type II. There will also be monovalent serums for the types to be used after one is recognized as the invader.

In Type III cases, the serum has not been useful. During 1926, our maximum Type III titre was 10 units against the stock culture. An efficient dose was not available. During 1927-28, we had a serum containing as much as two thousand units of Type III when tested against stock culture, but this serum had only 30 units of protection for a recently isolated culture. With the lapse of time, six months, the virulence of the cultures obtained from patients diminished, as did the size of the capsule, and the apparent titre of the serum became greater. Doctor Park and Miss Cooper have since found marked variation in the virulence of recently isolated cultures of Type III organisms. At present we have no efficient serum for Type III, in spite of having a potent serum against the laboratory culture. This is apparently due to the large capsules or to a difference in the character of the specific soluble substance. The strains collected are being studied with a view to further therapeutic attack.

THE SERUM

Considerable advances have been made in the production of serum, by reason of increased experience with

horses. One horse produced serum of 1200 units, Type I, per cubic centimeter. There have also been improvements in the methods of extracting and refining the serum.

When the protective serum was originally introduced, it contained on the average approximately 80 units per cubic centimeter. The contents of a vial which contained three ounces, or 90 cubic centimeters, was injected at each dose (7200 units). This was injected very slowly, and required considerable apparatus to keep the serum warm and uncontaminated. With the effective antibody, both inert and deleterious matter was injected, and repetition of such large doses of serum was harmful to patients and frequently occasioned serum sickness. At present, a 10 c.c. syringe is all that is required to administer serum, transferring even more protection than was present in the larger dose of crude serum. Occasionally an effective dose may be contained in 2 c.c.

This reduction in volume is brought about by precipitating with salt at a definite pH; all fractions but the globulins with which the antibody is associated are thus separated; the pseudoglobulins are then thrown down by dilution in large volumes of ice-cold acidulated water, or the salts are removed by dialysis. These methods were applied and perfected by Banzhaf, Felton and Sobotka. Deleterious and inert substances are removed, as there are few chill or temperature reactions, and very little serum sickness. Occasionally, there is some coughing, and flushing of the face, after the first injection. Similar reactions are sometimes observed after calcium chloride or salvarsan injections.

Each lot of serum is tested for chill production, before use, by injecting progressively increasing doses, up to 20 c.c., at intervals of eight hours, into arthritis patients, as a non-specific therapy. In such patients, the occurrence of a rigor, if it occurs, will prove beneficial. If chills occur, with therapeutic doses, the lot is rejected and returned for further refining.

WHEN AND HOW SHOULD SERUM BE ADMINISTERED?

The antibody solution obtained from the serum should be administered as soon as the diagnosis of pneumonia is made. In very early cases, absorption may be sufficiently rapid from intramuscular injections; we inject the serum intravenously because our patients are usually seen when the disease has lasted several days, and because this is the most effective method. Twenty minutes before starting treatment, the patients are tested with a drop of serum instilled into one conjunctival sac. In twenty minutes, those sensitive have a congestion of the conjunctiva. If they are not serum sensitive, the serum is administered intravenously immediately after the blood culture has been taken.

THE DOSAGE

On admission, 10,000 units of Type I and of Type II are given. This is repeated every eight hours until the temperature has fallen below 102° F. In known positive blood culture cases, an extra dose of the serum should be administered, in order to make sure that an ample amount has been given; the time and the dosage may be increased to 15,000 or 20,000 units every four to six hours. More recently, we have checked the adequacy of our dosage by determining the presence of antibody by agglutination. This is done by rolling, in test tubes, the patient's serum with an emulsion of killed pneumococci of the invading type, in various dilutions. The serum should be given in amount sufficient to be detectable by this method.* Patients who are invaded with Type II, require a larger dose, as this type apparently produces a specific soluble substance, or requires more to agglutinate it. This may be related to the diffusing power of the specific soluble Type II, revealed by Heidel-

of microscopic agglutination has
ers, Mr. Albert B. Sabin, which has
sitive and more convenient. *Proc. Soc.*
xxvi, 492.

EVALUATION

The benefit accruing from the use of serum may be seen by studying the entire experience, or by a study of the result in an individual case. An evaluation of the result is beset by the difficulty that 70 per cent of patients will recover by their own protective mechanisms. They produce, in a period, usually, from five to nine days, sufficient antibody to neutralize the substances which abet growth of the organisms.

Unfortunately, either by reason of a failure of the spontaneous protective mechanism, or by reason of the very great virulence of the invading pneumococci, 30 per cent succumb. It is impossible, at the onset, to determine clinically, what patients will recover. No one can say what patients will have their blood invaded by bacteria, nor can the invading type be determined clinically. To attempt any such clinical estimate is, in the present state of our knowledge, a dangerous and unscientific guess. Moreover, recovery is not entirely an immunological problem. Patients may overcome the invading bacteria, and yet succumb as the result of loss of aerating surface, from cardiac inadequacy resulting from the illness, or from disturbance in vital equilibria. This serves to complicate our problem.

STATISTICAL STUDY—STANDARD ERROR

It is fortunate that the statisticians have placed at our service, when we are considering our serum experience, an instrument for determining the effect of serum in a sufficiently large series of cases, adequately controlled. One may readily ask what is a sufficiently large series of cases. Is it 50? Is it 100? The answer cannot be given in numbers until we know that the series must be of such magnitude that the ratio of the difference in the results of treatment must be twice the standard error. The standard probable error is as three to two. There are ways to change this ratio, an increasing difference in results in serum and serumless cases,

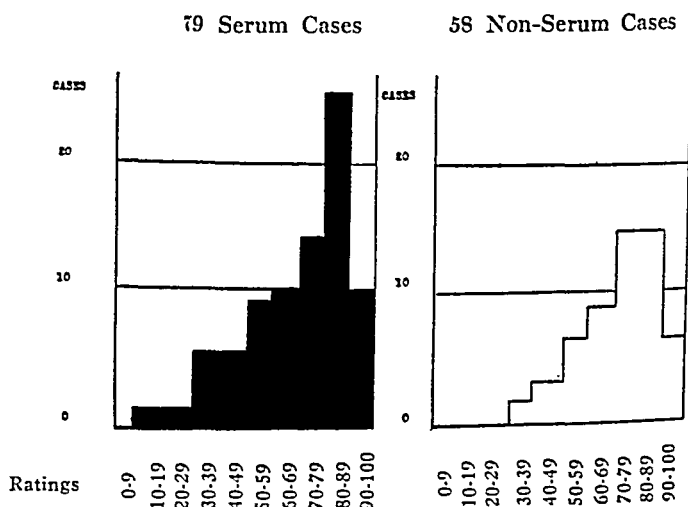
and the number of cases studied. We have chosen death and recovery as end points, about which none can dispute, though improvement from serum may have occurred in cases which subsequently die, as, from empyema, or exhaustion. Dr. Dublin of the Metropolitan Life Insurance Company has analyzed our data, and guided us in their interpretation.

For Type I cases, we obtained a sufficiently large series by our studies of 214 cases (see Table I), 105 in the control, and 109 in the treated series. We have made the conditions of the experiment as similar as possible, by rating the cases, so that we know that equally severe cases shall be in each series, determined by rating them, by taking alternate cases, and by having a uniform standard treatment. These conditions have been described in another presentation. I have prepared a graph showing the distribution of the cases, by rating, in each group, for Type I and Type II (see Fig. 2, a and b). It will be seen that, in general, the rating is similar.

FIG. 2 (A)

Littauer Pneumonia Fund—Harlem Hospital—1927-28

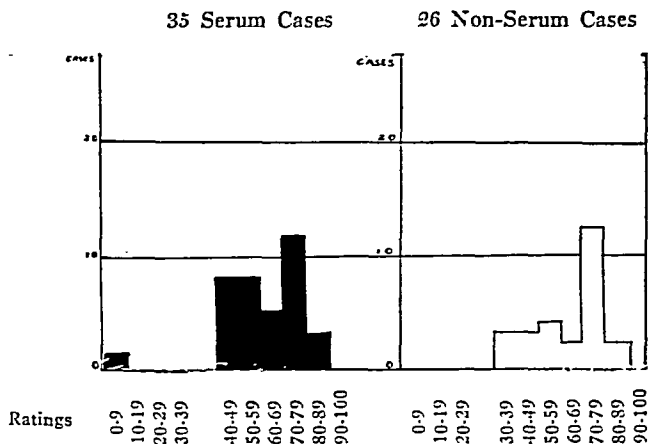
Type I.



Distribution of cases according to ratings. Serum and non-serum cases,

FIG. 2 (B)

Type II.



Distribution of cases according to ratings. Serum and non-serum cases,

The importance of concurrent control is shown in the graph of the results in two years' statistics. In 1928, both serum and serumless cases showed better results than in 1927. The mortality varies from year to year; therefore, only series of simultaneous cases can be compared (see Fig. 3). We have found, in our studies, that there is a reduction of mortality with serum, in Types I, II, and in what we formally classified as Group IV or the miscel-

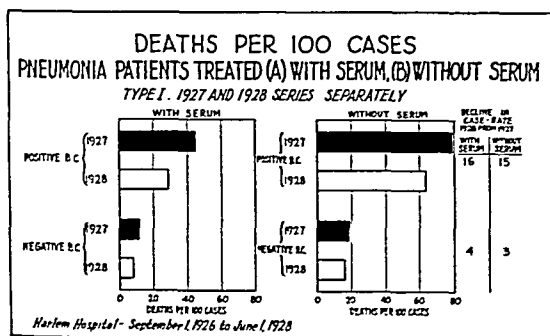


FIG. 3

LITTAUER PNEUMONIA FUND OF NEW YORK UNIVERSITY

DEATHS PER 100 CASES

PNEUMONIA PATIENTS TREATED (A) WITH SERUM AND
(B) WITHOUT SERUM

Harlem Hospital. September 1, 1926 to June 1, 1928

1927 AND 1928 SERIES SEPARATELY

(A) With Serum			(B) Without Serum		
	Cases	Deaths	Deaths per 100 Cases	Cases	Deaths Per 100 Cases
<i>Type I</i>					
Total Cases					
1927-28	109	18	17	105	33
1928	54	8	15	52	15
1927	55	10	18	53	18
Positive Blood					
Culture					
1927-28	28	10	36	28	20
1928	17	5	29	14	9
1927	11	5	45	14	11
Negative Blood					
Culture					
1927-28	80	8	10	74	13
1928	37	3	8	8	6
1927	43	5	12	36	7
<i>Type II</i>					
Total Cases					
1927-28	56	13	23	61	18
1928	30	7	23	23	4
1927	26	6	23	38	14
Positive Blood					
Culture					
1927-28	14	7	50	11	9
1928	9	4	44	1	—
1927	5	3	60	10	9
Negative Blood					
Culture					
1927-28	42	6	14	47	9
1928	21	3	14	22	4
1927	21	3	14	25	5

laneous group. This reduction in mortality occurs whether the cases are treated early, within three days, or whether they are treated later in the course of the disease. For Types I and II, the result of treatment in those attended within three days of onset, and those who had been seen four days or more after the onset are shown in Figures 4 and 5. The improvement in mortality is slightly better in the early cases than in the late ones.

Physicians frequently withhold serum if the type is recognized later than the first few days. This is unfortunate, as frequently patients can be saved who are treated later, and even late in the disease.

The invasion of the blood stream may occur later than the third day, and such cases may have their blood stream rendered sterile by serum, as I shall show in the chart of a patient, later in the presentation. No one can tell, during the progress of the illness, how much protective substance has developed, what may be the body's capacity to develop it, or the eventual need. It seems safer to supply it in excess than to chance that any shall be lacking.

The statistics of Harlem Hospital show a definitely lower mortality for Type I and Type II; it is also shown by the combined statistics of Harlem, Bellevue and New York Hospitals (Figs. 6 and 7). The most marked difference in mortality is shown in the cases which have a positive blood culture, as the statistical analyses of my colleague, Doctor Rosenblüth, revealed (see Fig. 8). In fact, we have ceased, at Harlem Hospital, to alternate the use of serum in cases in which we find an invasion of the blood stream with Type I organisms, for it is felt that, for these cases, statistical proof has been given, and it is unjust to withhold an available life-saving procedure; the ratio of the difference to the standard error, in this type, is 2.4 to 1.

For Type I, I have prepared a chart showing our experience with serum and controls in which the thirty-four cases are studied as to result, and classified by days and number of colonies per plate (see Table II, page 360). I

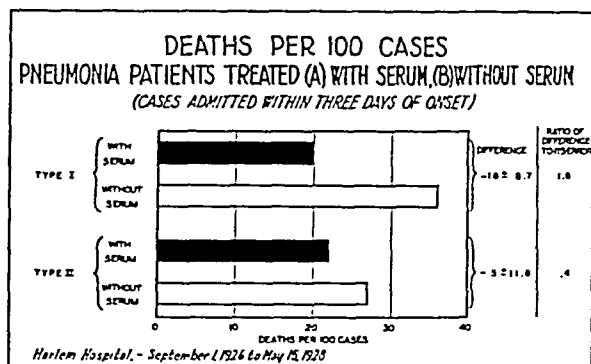


FIG. 4

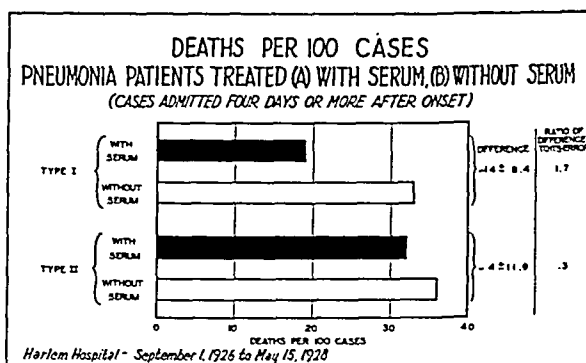


FIG. 5

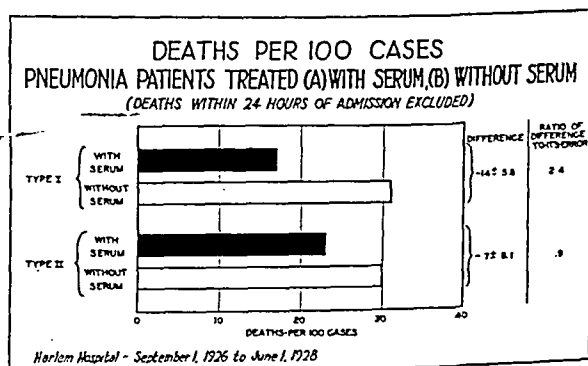


FIG. 6

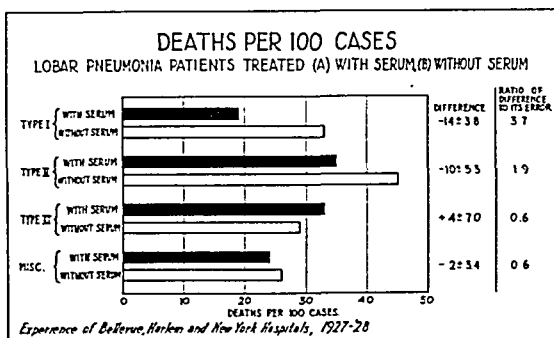


FIG. 7

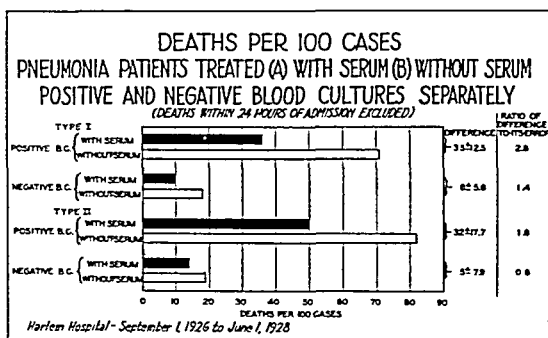


FIG. 8

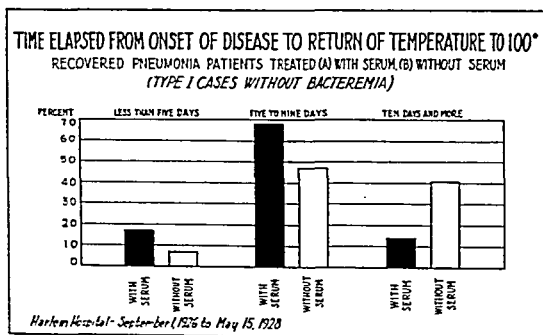


FIG. 9

Littauer Pneumonia Fund—Harlem Hospital—1927-28

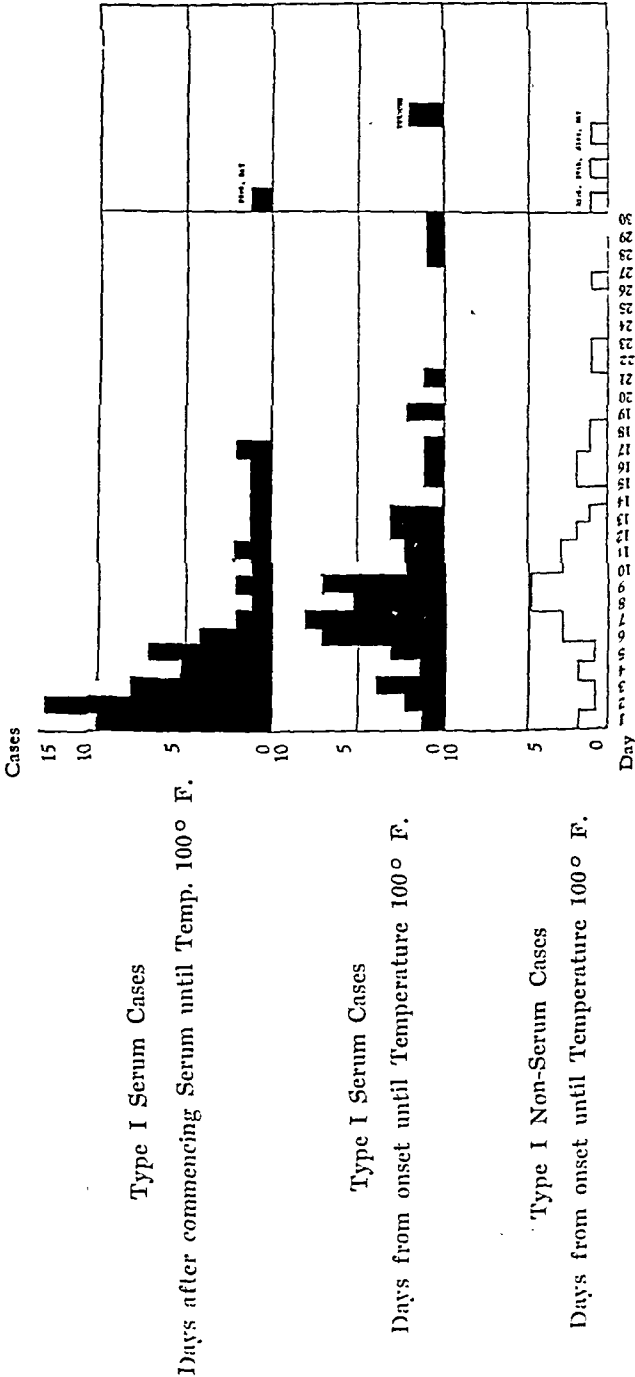


FIG. 10

have also given the experience with Type II (see Table III, page 63). For this type, I am less sure of my results as some fatal cases may have been sub-groups of II, now classified by Doctor Park and Miss Cooper as Type V and Type VI.

DURATION

In those who recover, the duration of illness, with its hazards and destructive changes, is shortened. This is seen from an analysis of the diagram (Fig. 9) in which 16 per cent of the Type I cases to whom serum was given, had normal temperatures within five days, whereas only 8 per cent of the cases without serum had temperatures normal within five days. Sixty-eight per cent of the patients who had serum, had had their crisis between the 5th and 9th day, while only 48 per cent of those who had not received serum, had their crisis within that period. It required ten days or more, for only 12 per cent of the cases to whom serum had been given, to reach 100, while 40 per cent required this length of time when serum had been withheld (see Figs. 9 and 10).

SEVERITY OF ILLNESS

More gravely sick patients are saved with serum than can be saved without serum. This is shown in Figure 11, page 45. Almost 40 per cent of the patients rated poor were saved with serum, while we saved none of those rated as poor, among those where serum was withheld. Seventy per cent of those rated fair, recovered where serum was employed, while without serum, more than half perished. With serum, in the patients rated good on admission, the death rate was 8 per cent, and without serum, it was 14 per cent. This general statement of better results is of prime interest to us as physicians and encourages us to use serum.

Confronted, however, with a particular patient suffering from pneumonia, we are beset by certain urgent questions. Shall we employ serum for this patient or is there some contra-indication? What are the contra-indications for serum treatment? When have we given enough serum?

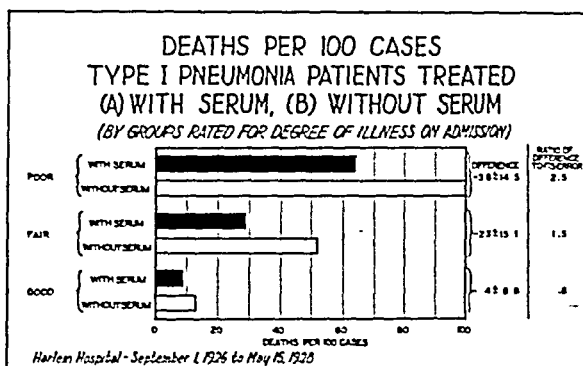


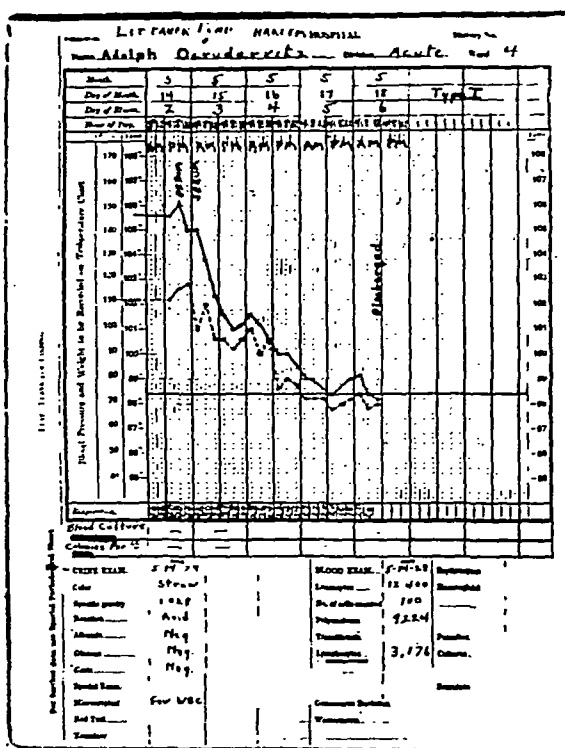
FIG. 11

CONTRA-INDICATIONS

We have withheld the serum from definitely moribund patients. We have not given serum intravenously to patients suffering from asthma, or with a history of horse sensitiveness. Otherwise, we have not withheld the serum. These cases, if they come in on the serum series are, of course, included in the serum group and counted as deaths against it, should they die. Lateness in the disease is not a contra-indication; anoxaemia is not a contra-indication, nor is cardiac irregularity or very marked rapidity; high blood pressure and low blood pressure are not contra-indications; organic valvular disease is not a contra-indication; neither is extreme age nor early youth a contra-indication.

We must reiterate that it is only after a complete bacteriological study of the cases, that we can assert positively the need for serum, but delay for such study, just as delay for throat culture reports in diphtheria, may spell disaster to our patients. On this account, we feel that any patient suffering from lobar pneumonia, should receive polyvalent serum, when that diagnosis is definitely established.

In order to answer the question whether enough serum has been given, let me show you what happens most frequently to the temperature (see Fig. 12). The temperature falls after serum has been administered. Those pa-



tients, whose temperature has fallen, are not immediately well; there may be a secondary rise of temperature; in some of these cases, ample antibody is present, and in some, the process of resolution and of recovery from the effects of the severe intoxication must be overcome. At Harlem Hospital, in the serum series, the serum is persisted with in all cases until the mouse heart's blood has been examined. It is discontinued when this examination reveals neither Type I nor Type II. This usually requires 36 hours.

At times, a diagnosis and also the need for more serum may be made by determining the presence of antibody in the blood.³ When known, large amounts of antibody of two

³ Agglutinin is actually titrated.

types are injected, the disappearance of one from the serum and with only a slow reduction of the other is suggestive evidence that the infection is of the type which has disappeared. Antibody is then not revealed because it has been neutralized by the specific soluble substance in the blood. Serum is required until antibody can be demonstrated continually. This is shown in Figure 13, where A. D. T. indicates antibody test. This patient suffered from Type I pneumonia.

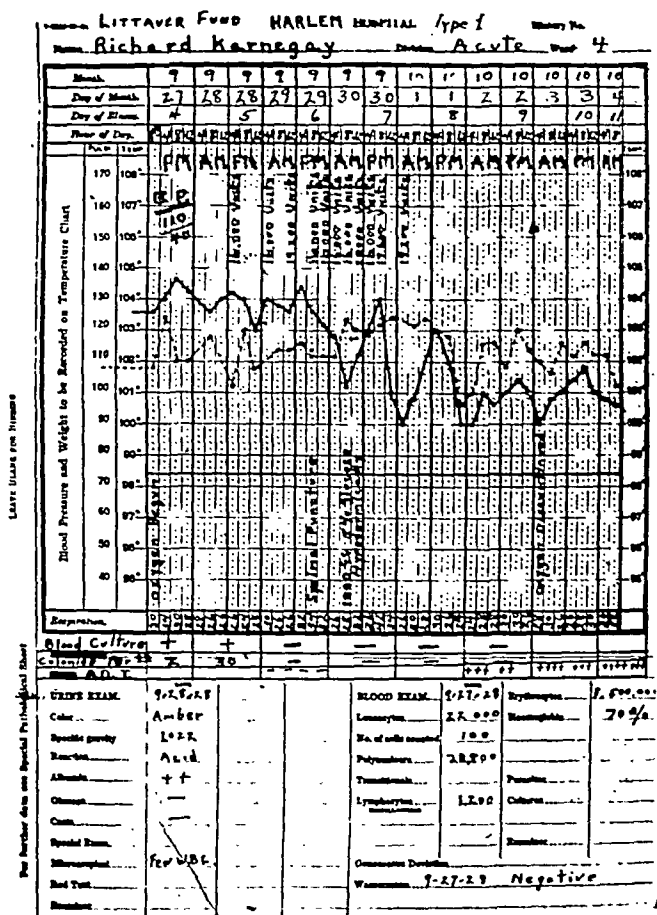


FIG. 13

REACTIONS

I will now take up the question of reaction. In most cases, the serum is given with as little immediate effect on the circulation as the injection of so much saline. In others, there is a slight flushing of the face, and in other cases, there is some difficulty with breathing, and a slight dry cough. Again, we may have a rise of temperature of .5 to 1.5 or even 3° F. which occurs immediately or in thirty to sixty minutes after the injection, and in some, a chill of varying severity, usually a very slight one. Such reactions occur, usually, after the first injection, much more rarely after the subsequent injections and possibly occur more frequently with certain lots of serum. There may be some condition in certain patients which predisposes them to reactions with any serum, or, at times, with serum which has previously not given chills. Serum sickness of slight degree has been present in some cases. At times, there has been an urticarial rash; at times, joint pains with a rise of temperature of several days' duration.

When have we given enough serum? I have prepared a chart to show the amounts of serum administered (see Fig. 14). In some there have been very great quantities given; in some, the early cases, smaller quantities have been used. In the administration of serum, there are always the unknown factors of how much protection has already been elaborated in response to the given bacterial stimulus, the ability of the body to continue adequate production of protective substance, as well as the unknown amount of specific soluble substance being produced.

In connection with the study of our cases, we have frequently noted a continuance of temperature, never very high, after there is an excess of antibody in the blood stream. This leads us to a discussion of what the antibody actually accomplishes. It is probable that the antibody neutralizes the specific soluble substance, and there may be some other mechanism for the destruction or neutralization of the general bacterial protein. As I have already said, antibody is given until the temperature is

Littauer Pneumonia Fund of New York University
Harlem Hospital

Type I Cases

Serum administered in Units—and Deaths

Recovered patients—white, deaths—black, sum = total patients

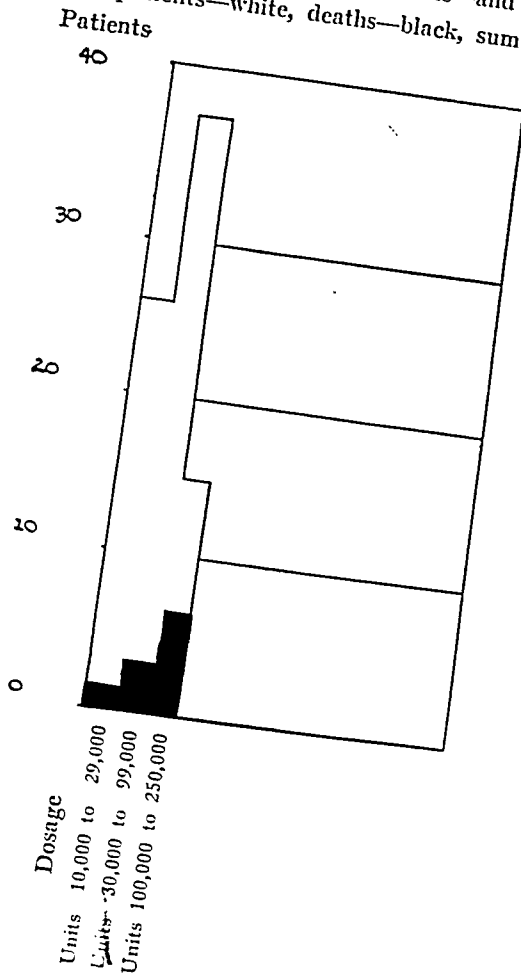


FIG. 14

below 102° F. and the blood stream is sterile or until antibody can be continuously shown in the patient's serum.

FAILURES

In spite of the marked reduction in death rate observed in the series treated with serum, we must still account for one death out of five of our patients suffering from pneumonia. This I shall endeavor to do.

Frequently, patients seem to have obtained great benefit from serum, and nevertheless, they die. The blood stream may become sterile, the temperature may fall, and they die of anoxaemia, anhydremia and various complications. But aside from these factors, to the correction of which our present effort is directed, are there cases in which the serum fails, either to sterilize the blood stream, or to keep it sterile?

During the past year, we have greatly improved our typing methods, and discovered errors, especially in reference to Type II and Type III cases. Nevertheless, during the year, we have had four cases of Type I, and three cases of Type II, in which the serum was ineffective, failing to sterilize the blood (see appendix). Once the blood culture became positive after serum was injected, in Type I. This case recovered with additional serum. The record of another patient, without serum, who continued to have fever and died, is shown for contrast. Four cases continued to have a positive blood culture in spite of serum. Five cases had their blood sterilized, but died, and only one case had the blood sterilized spontaneously; he died. In this case, though the sputum typing was Type I, the blood showed streptococcus hemolyticus.

Two Type II cases had the blood culture become positive under observation, and died. One had much serum; it was probably administered too late. The other had the serum discontinued too soon. These cases were treated before the importance of serum antibody determination was realized. Two cases failed to become sterile. In one, the temperature fell at first, and later rose with increasing septicemia. Before death, there was excess antibody, and the patient's serum was protective for stock cultures. We might have done better if more serum had been given early. The serum should have been tested against the patient's own culture. At this time, we were not recognizing the IIa or IIb, our present Types V and VI. The other patient entered with an overwhelming septicemia. The organisms in the blood post mortem, may have been agonal.

In Type III cases, two patients died and one recovered in the serum group, and two patients died and one recovered in the non-serum group.

In the light of our present knowledge, it is useless to record the blood culture statistics collected for Group IV (miscellaneous group) without more definite knowledge of the new types involved.

After reviewing these failures, one may ask what does the serum accomplish? It confers a passive immunity against that type of organism for which it is intended. This immunity is brief, but it is available at the time of greatest need. It does not cause the pathological changes in the lung to disappear promptly. It does not prevent death from anoxaemia; it does not neutralize such substances as may be produced by autolysis of collections of pus. It does not take the place of careful nursing and skilful medical observation and treatment of distressing symptoms, as cough, sleeplessness and distention. Oxygen, administered continuously by metal nasal catheter, tent, or chamber, should be employed.

Since the serum is apparently so helpful in the treatment of pneumonia, what are the objections to its general use in private practice? What can be the objections? Many feel that the fatalities are so rare [and they may very well be, in any brief individual experience], that they can afford to chance the issue with general nursing care. This point of view was warranted when medicine had nothing of proven curative value to offer. Others object that the cost of serum is great, and a needless charge against patients who may possibly recover without the expense. It is true that the cost of serum, for the average case, may well be as much as fifty dollars, and may even be several times the amount. In comparison with the cost of surgical care, this is moderate. The cost of serum production is great and must remain so for the present. This is occasioned by the fact that it takes considerable time to raise the antibody content actively in horses to a point

where it is worth while to concentrate the serum for treatment. It takes from six to twelve months to immunize the horses, and their productive life is relatively brief, about two years from the time vaccination is commenced. The serum then becomes too weak in antibody content for use, or what most frequently happens, the horses die at that time as the result of the injections and frequent bleeding. They are productive for six to eighteen months and yield, on the average, a liter of refined serum each month, and this serum contains, on the average, one hundred doses per liter. Some horses may be vaccinated which are useless in serum production, and others may promptly produce serum of great potency. No one knows the reason for this difference. A splendid opportunity for philanthropy lies in the determination of the genetics of immunity production, especially as applied to the production of therapeutic serums. Besides this uncertainty in connection with choosing animals for inoculation, there are special hazards in the industry, such as epidemics among the animals, and spoilage during manufacture and transit.

Table IV shows the length of time that it took a number of horses to produce antibody of given titre, in response to vaccination. This immunity, thus produced actively in the horses, varies in amount, though the same stimulus was employed. When produced, it is transferred by serum treatment to patients.

VACCINES

This leads us to a consideration of the logic of administering vaccines to patients gravely ill. The theory of injecting vaccines for treatment assumes that the stimulus to active immunity is inadequate. It is difficult to see how adding more antigen can be of service in patients where the blood stream is already invaded. There has been no properly controlled and studied series of pneumonia patients submitted to vaccine treatment.

It may be objected that the serum treatment, with its frequent injections, its careful typing, its blood cultures

and its antibody tests, requires expert and special skill. That is true; at present, there is required a technic, and trained bacteriologists; in fact, a teamwork and devotion, with a ritual as elaborate, in its way, as that required for surgical operation. It requires, also, good serum of known titre. But the prize may be a human life, and is frequently a shortening of the illness, with its attendant pain and hazards.

It is hoped that the technic may be simplified, that better and cheaper serum will become available as the demand increases, and more horses are immunized. With more concentrated serum, larger doses may be administered, and antibody potent against more types will be given at the initial injection.

It is only by early diagnosis and prompt use of the serum in the hands of general practitioners, that the dramatic results we have witnessed can be extended, and mortality from pneumonia greatly reduced. As the result of delay, the need for the more elaborate procedures requiring special skill, are necessary.

General use of serum means a revolution in the outlook of physicians, upon the treatment of pneumonia. It makes them hopeful, and gives them, instead of a philosophy of watchful waiting, a directly curative agent with which if employed sufficiently early, they may terminate the disease. Only when this change in practice shall be accomplished, and there is country-wide lessened suffering, with death frequently held away, will those who are engaged in the work, and the generous donor of the Littauer Fund, feel repaid for their effort.

STATEMENT OF SERUM FAILURES IN 1927-28

TYPE I—SERUM CASE (TEMPORARY FAILURES)

First blood culture Negative—Subsequent Positive

<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Day Admitted</i>	<i>Day Positive</i>	<i>Remarks</i>
Naomi McKee <i>Hosp. No.</i> 3677—5/1/28	38 yrs.	57	3rd Blood Culture Negative	5th+ in broth	This blood invasion occurred with a recrudescence after temp. was below 100° F. for 20 hours. 48,000 units of serum had been given. The subsequent course lasted 48 hours and 164,000 units serum were given. Diagnosis rested on mouse heart's blood. Result: <i>Recovered</i> .

TYPE I—NON-SERUM CASE

First blood culture Negative—Subsequent Positive (for contrast)

<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Day Admitted</i>	<i>Day Positive</i>	<i>Remarks</i>
Henry Fleming <i>Hosp. No.</i> 3304—1/8/28	34 yrs.	75	2nd Blood Culture Negative	5th+ in broth Plates 3 and 7 Colonies	Death with delirium and anoxaemia. Temp. continued high for eight days.

TYPE I—SERUM CASES

With blood culture continuously Positive—Patients died

Name	Age	Rating	Ill	On Admission	A.D.T.	Remarks
John Lewis Hosp. No. 3187—4/1/28	28 yrs.	30	7 days	4/1/28 Broth + Plates 315-300 Colonies	4/2/28	Serum given: 4/1 24,000 units 4/2 24,000 units 4/3 42,000 units 4/4 30,000 units Temp. fell to 98° dose. Found dead in bed at 8:35 a.m., six hours later.
Angel Garcia Hosp. No. 5681—5/23/28	49 yrs.	35	5 days	5/23 Broth + Plates 350-450 Colonies		Received 100,000 units serum in 24 hours. There was no fall in temp. Post mortem chest culture Type I.
Sam Ripka Hosp. No. 3106—5/35/28	53 yrs.	30	4 days	5/24 Broth + Plates 1000-15000 Colonies		Received 10,000 units serum Type I and 4,000 units Type II. Died in less than 8 hours.
James Stewart Hosp. No. 3236—4/20/28	35	25	3 days	5/25 Broth + Plates 7 and 14 Colonies Miscellaneous and Type I.		Serum given: 4/20 20,000 units 4/21 40,000 units Patient delirious. Temp. rose to 105°. Died 18 hrs. after admission. cocci Type I.

TYPE I—SERUM CASES

Blood culture became Negative and patients died

Name
Charles Henry
Hosp. No.
3250—12/9/27

<i>Age</i> 46 yrs.	<i>Rating</i> 65	<i>Ill</i> 2 days	<i>On Admission</i> Broth negative 3 colonies on one plate	<i>Remarks</i> Serum received: 12/9 12,000 units 12/10 24,000 units Temp. was 102° or below 12/11 and 12/12 but pulse continued rapid. On 12/13 temp. rose to 103° and death oc- curred with vomiting and distention.
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Name
John DeSylvn
Hosp. No.
107—2/21/28

<i>Age</i> 52 yrs.	<i>Rating</i> 78	<i>Ill</i> 4 days	<i>On Admission</i> 2/21 Broth + Plates 5 and 6 colonies 2/22 Broth neg. Peritoneum-Misc. Mouse heart's blood—I.	<i>Remarks</i> Serum given: 2/21 10,000 units 2/22 45,000 units A.D.T. negative 2/23 15,000 units Temp. fell after 1st dose, then rose and was high for 3 days, then low, occasion- ally reaching 102°. On 3/13, patient re- ceived additional antibody preparatory to operation. 3/29 Empyema pneumococcus Type I R.B.C. 3,010,000 Hb. 60% Had one transfusion. Asthenic, pale and de- lirious. Died 4/13/28.
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TYPE I—SERUM CASES			
Blood culture became Negative and patient died			
Name Bob Thornton Hosp. No. 3501—3/19/28	Age 46 yrs.	Rating 30	Remarks
		On Admission 3rd day Broth + Plates 34 and 45 3/20/28 Broth and plates sterile	Patient received 95,000 units serum before A.D.T. positive and 30,000 units next day. Temp. continued high. Marked dehydration. Hb. 145%—Hematocrit 63%.
Name John Scherer Hosp. No. 3447—3/8/28	Age 59 yrs.	Rating 65	Remarks
		Admitted 3rd day On Admission 3/8/28 Broth + Plates 2 and 19 Colonies 3/10/28 Broth —	Patient received serum for three days. 3/8—15,000 units 3/9—15,000 units (Temp. fell below 102°) 3/10—60,000 units 3/11—45,000 units Temp. fell to normal but patient be- came progressively weaker and died next morning.
Name Emanuel Johnson Hosp. No. 3571—4/19/28	Age 45 yrs.	Rating 90	Remarks
		Ill 5 days	On Admission 4/19 Blood C. — 4/26 Broth +
			4/19 20,000 units S 4/20 20,000 units 4/21 20,000 units 4/22 10,000 units A.D.T. negative 4/23 20,000 units A.D.T. negative 4/25 10,000 units A.D.T. negative 4/26 8,000 units 4/27 Patient died with temp. normal, pulmonary edema and foul smelling spu- tum. Had had, since 4/23, a stomatitis and sublingual glossitis and hiccough.

TYPE I—SERUM CASES

Blood culture Negative and patients died

<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Ill.</i>	<i>Remarks</i>
Esperanza Suvio	31 yrs.		7 days	
<i>Hosp. No.</i>				Serum given:
3648—4/20/28				4/27 20,000 units
				4/28 50,000 units
				4/29 55,000 units
				On 4/28/28, temp. fell to 100°—on 4/29/28, temp. rose to 106°.
				Death with wild delirium, and pulmonary edema. Post mortem chest culture showed miscellaneous group organisms.
				<i>Remarks</i>
				Marked asthenia—clubbed fingers—apical involvement.
				Right lower lobe pneumonia.
				Serum given:
				1/31 32,000 units
				2/1 90,000 units
				2/2 50,000 units
				2/3 60,000 units
				2/4 20,000 units
				Temp. fell from 106° to 102°. Recrudescence on 2/2 influenced by serum. Death with pulmonary edema.

Name
Fred Sorrentino
Hosp. No.
1009—1/31/28

TYPE I—NON-SERUM CASES

Blood culture became Negative but patient died

<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>On Admission</i>	<i>Remarks</i>
Michael Acosta	30 yrs.	68	11/4 Blood Broth +	Temp. fell by crisis 11/7. Died next day
<i>Hosp. No.</i>			Plates 35-10 Streptococcus with temp. 102° and pulse 160.	
3197—11/4/27			hemolytic colonies	
			11/5 Blood Broth negative	
			Plates 33-15 Streptococcus	
			hemolytic colonies +	
			11/7 Blood Broth negative	

Name

Harry Williamson
Hosp. No.
3443—2/25/28

Negative blood culture became Positive—patient died
Age 46 yrs.
Rating 50
Alcoholic 1 day

2/25 Blood culture negative.
2/26 Received 4,000 units serum
2/27 Received 16,000 units serum
2/28 Received 30,000 units serum
2/29 Received 50,000 units serum
Plates 14 and 20
Received 85,000 units serum

Name
Jeff Miller
Hosp. No.
3473—3/13/28

Age
39 yrs.

Rating
57

Admitted
1st day

A.D.T.—1/5000 unit protection. Temp. fell to 99° F.
A.D.T. negative
Died next day—pulmonary edema. Patient became delirious four hours after last dose serum. Temp. 101° F.

3/13 Blood Culture negative. Sputum miscellaneous.
3/17 Blood C. II.
3/18 Broth + Plates neg.
3/19 A.D.T. negative
Serum given
3/13 10,000 units
3/14 20,000 units
3/15 30,000 units
3/16 10,000 units
3/17 None
3/18 120,000 units
3/19 132,000 units
Post mortem heart's blood contained gram positive diplococci. Patient died with edema of lungs and cyanosis.
(Possibly Type 5 or 6).

TYPE II—SERUM CASES

Blood culture did not become sterile—patients died

359

<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Ill</i>	<i>Remarks</i>
Paul Cotton	35 yrs.	55	4 days	2/12 Broth + Plates 15 and 22 colonies
<i>Hosp. No.</i>		Cyanosed		2/14 Broth + Plates 90 and 122 colonies
3388—2/12/28		and distended		2/15 Broth + Plates 500+ 500— colonies
				Patient was given 10,000 units serum on admission. Temp. fell to 101°. On 2/14, temp. rose to 101°—patient was given two doses 8,000 units of Type II. On 2/15, patient received at:
				6:30 a.m. 8,000 units Type II
				12:45 p.m. 26,000 units Type II
				A.D.T. for II —, —, —
				3:15 p.m. 50,000 units
				A.D.T. for II + +, +, +, —
				8:00 p.m. 30,000 units
				A.D.T. for + +, + +, + +, —
				1/50000 units protection for stock culture Type II
				Patient died with pulmonary edema.
<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Ill</i>	<i>Remarks</i>
Edwin Ashley	42 yrs.	5	6 days	Received 10,500 units Type II in polyvalent serum; one dose given, though moribund. Autopsy—Type II recovered from both lungs.
<i>Hosp. No.</i>		Alcoholic Pulmonary edema and convulsions		
3602—4/30/28				
<i>Name</i>	<i>Age</i>	<i>Rating</i>	<i>Ill</i>	<i>Remarks</i>
Ampero Cotto	36 yrs.	43	5 days	3/30 Broth + Plates 29 0 colonies
<i>Hosp. No.</i>		Distended		3/31 Broth + Plates 30 57 colonies
3183—3/30/28				4/1 Temp. reached 100° in morning and 103° in p.m.
				4/2 Broth + Plates 1 2 colonies
				4/3 Broth + Plates 67 51 colonies
				Temperature reached 107°. Patient died.

TABLE II LITTAUER PNEUMONIA FUND OF NEW YORK UNIVERSITY HARLEM HOSPITAL

Type I—Blood Culture (S) Serum and (C) Control Cases
Number of Colonies in 1st blood culture and in subsequent daily blood cultures and result

Day of Illness	7 Cases Broth Only	12 Cases Less than 10 Colonies	4 Cases 11 to 19 Colonies	5 Cases 21 to 30 Col.	6 Cases 51 Colonies and over
1					
2	S R 1st cul. neg. Positive 3rd day in hosp.			C D 6-23 S R	
3		SS RR C D (Positive on 2nd day in hospital)		S R	
4	S D S D	SS RR CC RD	C D C 3,0 R		C D Several thousand
5	C R				C D 160,300,1000
6	C R	S R C 7,0 R S R C 7,0 R	S R		250,15,5 C D 82-5, 5, 2, 0 C D 400-1300 C 600 D
	C R C D Positive after 7 dys. in hosp.			S R	S D 307-3
		C D 1st day—400 2nd " 1000			
			C D Only in Broth		

Name
Harry Williamson
Hosp. No.
3443—2/25/28

Negat
Age
46 yrs

TABLE III

LITTAUER PNEUMONIA FUND OF NEW YORK UNIVERSITY
HARLEM HOSPITAL

Type II—Blood Culture (S) Serum and (C) Control Cases

Number of Colonies in 1st blood culture and in subsequent daily blood cultures and result

(R—Recovered; D—Died)

<i>Day of Illness</i>	<i>Broth Only</i>	<i>1 Case Less than 10 col.</i>	<i>3 Cases 10 to 19 col.</i>	<i>1 Case 50 col. and over</i>
1	S R S D (Neg. until 4th day then 18			
2			S. D Positive after 1st day	
4	C R			
5	S R		S. D 106-500	
6	S R			
7				S D 5000
8			S R 4, 1, 1, 4, 5, 12, 0	
9		S R		

TABLE IV

LITTAUER PNEUMONIA FUND—NEW YORK UNIVERSITY

Production of Antibody in Horses. Potency or Antibody Titre developed, by months.

Horse No. and Antigen Type	Month	1	2	3	4	5	6	7	8	10	14
59 I and II			100-I								
42 I and II			50-II		100-II						
47 I and II				50-I	100-I						
105 I and II			100-I	25-II							
228 I and II	50-II			100-I	100-II				200-I		200-II
227 I and II		100-I*			200-I				200-II		
226 I and II		200-II*		100-II					200-II		
224 I and II			50-II								
147 I and II			50-I			25-I					
170 I			50-II								
223 II	50-II	50-I			100-I	200-I					
222 II		100-I	200-I						200-I		
221 II			100-II								
220 II			50-II							500-I	
					100-II						
					100-II						

* 2½ months.

TO THE GREAT CLINICIAN FRIEDRICH VON
MÜLLER ON HIS SEVENTIETH BIRTHDAY

(Translated by MRS. EPHRAIM SHORR)

Great clinicians place their mark on a city. The professorship of internal medicine in particular, which now, as ever, represents the immovable mid-point of medicine and hygiene, emits rays which penetrate even those remotest strata of culture which have scarcely any apparent connection with medicine. The personality of the internist stamps the understanding of entire generations of physicians; it determines the increasingly comprehensive understanding of the preservation of health and prevention of disease throughout the whole country; and it shapes the public sanitary regulations. It attracts serious men from all parts of the world no less than do famous artists and art schools.

Geheimrat Professor Friedrich von Müller, the director of the Munich Hospital on the left bank of the Isar and head of the Second Medical University Clinic, is this kind of a personality of wide cultural significance. September 17th is the seventieth anniversary of his birth. Seventy years are long when one considers them only as a life that has been led—they are a short span of time when one considers the work which Müller has accomplished, when one reflects upon the lasting power which his teaching and his labor have exerted over countless men.

He comes from an old medical family which can be traced back to a great-great-grandfather. The father was for a long time the director of the medical division of the Augsburg Hospital.

Müller was born in Augsburg. He studied in Munich and Würzburg, and in Würzburg he obtained his first position as assistant to Carl Gerhardt. Later he went with him to the Charité Hospital in Berlin and in 1888 established himself there as a lecturer. In the following year he was appointed director of the Medical Polyclinic at

Bonn; the next year he became head of the Breslau Medical Polyclinic; and in 1892, by appointment as professor-in-ordinary, he became director of the Medical Polyclinic at Marburg.

Müller has always spoken with especial pleasure of his clinical activities in Basel, where he worked from 1899 until 1902. A great many celebrated physicians assisted him in his clinic, such as Professors Otto Neubauer (Munich), von Bergmann and Langstein (Berlin), and Falta (Vienna). In 1902, after the death of von Ziemssen, Müller received the directorship of the Second Medical Clinic in Munich and succeeded Bauer as head of the hospital on the left bank of the Isar.

In this position from the very beginning he was able to exert a great influence. It was his activity as a teacher which made the Munich medical faculty famous throughout Germany and beyond, attracting students from foreign countries. We pupils of Müller realize to-day, as we have always done, that the Müller ideal forms the nucleus of our medical knowledge. Objectivity and sincerity, as opposed to any nonsense and obscurantism, were the characteristic features of his teaching and of his understanding of natural phenomena and the art of healing. It is illuminating that in his necrology upon his own teacher, Gerhardt, Müller especially emphasized his intrinsic truthfulness and genuineness. This is in keeping with Müller's own character.

Müller's scientific works cover all territories of internal medicine and clinical physiology. His fundamental researches on nutrition and metabolism, on kidney disease and asthma, nerve disease, heart, jaundice, etc., have become signposts in therapeutics. His "Handbook of Medical Clinical Diagnosis," edited in collaboration with Seiffert, is a masterpiece of concentrated power of expression and is widely used. Müller early recognized the importance of chemistry in clinical diagnosis, and chemistry as a help in his laboratory has always played a leading part.

As during the past decades, Müller's medical skill to-day draws many sick people to Munich, seeking help. Both before and after the war, extended travel in the United States permitted the spread of his influence there and to other countries as well.

More than twenty years ago Müller was raised to the nobility. Last year he was made Honorary Citizen of the City of Munich. Müller's great services as rector of the university during the difficult and responsible years of 1918 to 1920 are unforgettable.

The many people to whom Müller in his active life has brought health, and thereby happiness, the many pupils he has prepared for their task in life, to-day think of their leader and helper with especial gratitude. With them we wish with sincere hearts that Friedrich von Müller may pursue for many years to come, in complete health and vigor, his busy but satisfactory activities, to the higher glory of Munich, to the happiness of his relatives, to the comfort of his patients, and to the satisfaction of his pupils and his friends.

W. SCHWEISSEIMER

From the *Münchener Neueste Nachrichten*,

September 15, 1928.

OSLERIANA

The Nematode Genus "Oslerus" (Hall, 1921). In 1877, Osler described a verminous bronchitis in dogs, due to a nematode worm, discovered and described by him as *Strongylus canis bronchiglis* and subsequently named *Filaria osleri* by Cobbold (1879). In 1921, M. C. Hall erected this into an ovoviviparous nematode genus *Oslerus*, with Osler's original worm as the generic type (*Oslerus osleri*). In the same year, L. Travassos added two new Brazilian

species, viz., *O. barretoii* and *O. gordius*, found in the lungs of South American lemurs. In 1928, Dr. Hans Vogel adds two more species, viz., *O. cynopithecii*, found in the body of an imported monkey (*Cynopithecus Maurus*) in the Hamburg Institute of Tropical Diseases, and *O. felis*, found in the bronchi of a South American ocelot. A full account of the whole matter, with the pathological changes produced by infestation and references, will be found in Dr. Vogel's interesting paper (*Centralbl. f. Bakteriolog.*, 1. Abt., Jena, 1928, CIX, 430-444, 1 pl.).

F. H. GARRISON.

COMMITTEE ON PUBLIC HEALTH RELATIONS

SUPERVISORY POWERS OF THE STATE BOARD OF CHARITIES

REPORT OF

THE COMMITTEE ON PUBLIC HEALTH RELATIONS

The Department of Charities of New York State came into existence by an Act of the Legislature passed on May 23rd, 1867, as "The Board of Commissioners of Public Charities." In 1873 the name was changed to that of the "State Board of Charities." It was set up to safeguard the welfare of the inmates of the State charitable and correctional institutions, as well as the expenditure of State appropriations. By the original Act the commissioners were given authority to visit and inspect all the institutions in the State receiving State aid, except prisons. In 1873 the powers and duties of the Board were extended and the Board and the several Commissioners were given the power to visit and inspect any charitable, eleemosynary, correctional or reformatory institution within the State (excepting prisons) irrespective of whether or not these institutions were in receipt of State aid or were maintained by municipalities or otherwise, and "also to visit and inspect any incorporated or private asylums, institutions, homes or retreats, licensed for the detention, treatment and care of the insane, or persons of unsound mind." The law specifically authorized the Board to collect information concerning those who receive aid from private charity and to present to the Legislature its views relative to the best methods of caring for the paupers and destitute children. Following the exposure of wilful neglect of children in some of the incorporated child-caring institutions, the Legislature in 1883 passed an amendment to the law regulating the incorporation of benevolent societies whereby a written approval by the State Board of Charities was required before the certificate of incorporation of any society having for its purpose

guage, in the present Membership Corporations Law, which was materially revised in 1926. The State Charities Law was further amended in 1896 and the general powers and duties of the Board were made even more explicit. This statute, however, in defining the powers of the Board followed the language of the constitution and did not contain the words "whether receiving state aid, or maintained by municipalities or *otherwise*," which appeared in the statute of 1873. Had that or a similar phrase been incorporated in the State Charities Law of 1896 (Chapter 546), as the Legislature had the right to do under the authorization of Article VIII, paragraph 15, that the Legislature may confer on the board any additional powers not inconsistent with other provisions of the Constitution, the decision of the Court of Appeals in the People *ex rel. v. N. Y. Society for the Prevention of Cruelty to Children*, would undoubtedly have been different, if, indeed, the proceeding had ever been instituted. The Legislature at the present time has full power to remedy the situation. In addition to the provisions of paragraph 15 of Article VIII, just referred to, paragraph 3 of Article V of the Constitution, provides that subject to the limitations contained in the Constitution the *Legislature may from time to time assign by law new powers and functions to* departments, officers, boards or commissions contained or created under this constitution, and increase, modify or diminish their powers and functions and that no specific grant of power by the Constitution to a department shall prevent the Legislature from conferring additional powers upon such department.

In 1899 the Dispensary Law was passed with the provision that the State Board of Charities "shall issue licenses to dispensaries and make rules and regulations in accordance with which such dispensaries shall furnish and applicants obtain medical and surgical relief, advice or treatment, medicine or apparatus." Just as the other acts pertaining to powers and duties of the Board, this law likewise is general in its application to all institutions, whether in receipt of public funds or not. In 1928 the

law was further amended and the Department of State Charities established, the head of which is the State Board of Charities. The duties of the Department are defined as follows:

- “1. To carry out the directions of the state board of charities with respect to visitation, inspection and supervision of institutions, which by law or the constitution, are made subject to the visitation of the Board. As used in this section and sections nineteen, twenty and twenty-two of this chapter, the term ‘institution’ includes any corporation, society, or agency or association which is or may be subject to such visitation, inspection or supervision.
2. To aid in securing the just, humane and economic administration of all institutions subject to such visitation.
3. To advise the officers of such institutions in the performance of their official duties and as to the best measures for the care and relief of their inmates and beneficiaries.
4. To aid in securing the erection of suitable buildings for the accommodation of the inmates and beneficiaries of such institutions.
5. To investigate the management of such institutions and the conduct and efficiency of the officers or persons charged with their management, and the care and relief of the inmates or beneficiaries of such institutions.
6. To aid in securing the best sanitary condition of the buildings and grounds of all such institutions, and advise measures for the protection and preservation of the health of the inmates and beneficiaries.
7. To aid in securing the establishment and maintenance of suitable industrial, educational and moral training in such institutions.
8. To investigate the condition of the poor seeking public aid and advise measures for their relief.
9. To administer the laws providing for the care and support of state and Indian poor persons and the removal of alien and non-resident poor persons.
10. To collect statistical information with respect to the property, receipts, expenditures and activities of all institutions subject to its visitations and the number and condition of their inmates and beneficiaries, and with respect to the poor receiving public relief and such other matters relating to dependency, juvenile delinquency and public and private charities as the board may deem advisable.”

On several occasions the powers of the Board were challenged, the Courts sustaining the Board until the adverse decision in the “Gerry Case” handed down by the State Court of Appeals. Expressing the opinion of the majority of the Court Justice O’Brien declared that “the

charity with which the State is concerned consists in the distribution of relief or public aid, the fruit of taxation levied alike upon the willing and the unwilling. The right of visitation and regulation applies only to those institutions, public or private, through which the State fulfills this function. They alone are within the reason of the law, and consequently within its scope and operation." And then, "a charitable institution within the meaning of the constitution *and the statutes* must be one that in some form or to some extent receives public money for the support and maintenance of indigent persons. By public money is meant money raised by taxation not only in the State at large but in any city, county or town."

"The defendant" (The New York Society for the Prevention of Cruelty to Children) "receives under the charter of New York the sum of \$30,000 annually from the city treasury to promote the objects of its organization. But in receiving and disbursing that sum of money, it neither receives nor administers any charity, but is simply allowed something by the city for doing work that otherwise would devolve, as we shall see hereafter, on the police department and which the society can do better and with much less expense than the police."

This decision was rendered on January 9th, 1900. Counsel for the State Board of Charities had urged upon the Court that this Society was subject to the inspection of the State Board of Charities because of the fact that it received exemption from taxation. The Court dismissed this argument with the following statement:

"The fact that the property of this corporation is exempt by statute from taxation only shows that it enjoys a special privilege in common with a great many other corporations that no one can claim to be of a charitable nature."

This decision has limited the original scope of the functions of the State Board of Charities. It has removed from its inspectional powers a considerable number of institutions. It has rendered the knowledge of the Board

fragmentary in relation to the extent and character of charitable work throughout the State and has deprived the State of the valuable statistical information with regard to the cost and the results of the work of a large number of charitable institutions, including hospitals. Only those hospitals come within its jurisdiction which derive any revenue from public sources.

It does not seem to be maintained anywhere in the opinion of the Court of Appeals that the Legislature did not have power to confer upon the Board the additional powers of visiting and inspecting all charitable and reformatory institutions whether supported in whole or in part by public funds, but merely that the Legislature had not made such provision. As a matter of fact Chief Judge Parker's opinion in concurrence, stated that

"If the Legislature, from which this relator originally obtained the power which has recently been incorporated in the Constitution, but on no broader lines than the legislative grants of authority" (Chapter 546, Laws of 1896) "deems it wise to give to the relator" (State Board of Charities) "the right of visitation and to make rules and regulations for this defendant, it can do so. And if later experience shows that the power is being exercised unwisely and to the serious detriment of a great public work, its grant of authority can be revoked. Neither the constitution nor the statutes have undertaken to give a definition of a charitable institution or corporation. That has been left to the courts, and if the definition of the courts be not broad enough to include as many institutions as the Legislature deems advisable, it can by further enactment bring in such others, or indeed every institution, corporation, society or association having for its purpose the promotion of the public welfare, whether their object be the enforcement of laws for the protection of children, the prevention of cruelty to animals or the accumulation of funds and their application for the purpose of foreign and domestic missions."

With the growth of endowments and the lessened need of many charitable associations to rely on municipal or county subsidies, the number of institutions coming under the supervision of the State Board will gradually decrease, and the entire fundamental purpose of the law, asserting the State's concern in the welfare of inmates of charitable institutions, will be frustrated, if by legislative action the effect of the "Gerry Case" decision be not nullified.

As a result of this decision several anomalies have developed. The Board's approval is essential for the incorporation of a charitable institution under the Membership Corporations Law. The incorporation exempts it from taxation but if the institution does not directly receive public funds, it may violate purposes for which it was created; being entirely outside the supervision of the Board it is not subject to any control whatever, by any administrative State department. The second anomaly in the case of hospitals lies in the fact that under the Dispensary Law the State Board of Charities has a right to inspect and demand reports from the out-patient department of the hospital, which otherwise is outside its supervision, because the hospital does not receive tax funds. Thus the State Board of Charities has authority over one part of the institution and no official rights whatever in the other part of the same institution.

The Committee on Public Health Relations of The New York Academy of Medicine is of the opinion that legislation should be sought which would restore the original powers of the State Board of Charities and which will enable the Board to exercise supervision over all charitable institutions in this State and over all tax-exempt hospitals whether in receipt of public tax funds or not.

It is the conviction of the Committee that no place where the sick are congregated should be without supervision of some kind on the part of the State or local authorities.

The Committee therefore strongly recommends that steps be taken to secure an amendment to the State Charities Law which would permit the restoration of its original powers to the Board of Charities. The Committee is of the opinion that as soon as possible similar powers of inspection and supervision should be given to the proper authorities to be exercised in relation to all proprietary hospitals, sanatoria, nursing homes and other institutions for the care of the sick.

RESOLUTION IN HONOR OF DR. DANA

UNANIMOUSLY ADOPTED BY THE COMMITTEE ON PUBLIC
HEALTH RELATIONS, FEBRUARY 5, 1929

In 1858, there was established by the Council of the Academy a section on Public Health. In 1908 a Committee on Hospitals was appointed by the President of the Academy, and in 1910 a similar committee was appointed for the purpose of representing the Academy at the municipal budget hearing before the Board of Estimate and Apportionment. These two committees were merged into a single one in May, 1911. The section on Public Health had failed to interest any considerable number of the Academy Fellows and was not functioning in an effective manner. Accordingly certain of the members of the Academy who had an interest in Public Health matters recommended to the Council that the section be abolished and some other plan be adopted to increase the Academy's usefulness in regard to public health problems. This recommendation was adopted by the Council and a plan proposed whereby the function of the Public Health section and the two hospital committees should be carried on by a single standing committee. On October 22, 1911, this committee, known as the Public Health, Hospital and Budget Committee was established by the Council. It seemed at that time that the Council felt it was essential that there should be a definite liaison between this newly formed committee which consisted chiefly of the younger and active men of the Academy, and the Council, so that the Council could have a guiding hand in the policies of the Committee. Accordingly the Council appointed as Chairman, Dr. Charles Loomis Dana, who for years had been actively associated with the affairs of the Academy, as Vice-President in 1901-1903, President in 1905-1906 and who was at the time a member of the Board of Trustees.

One of the first decisions made by the Committee was the determination to engage an Executive Secretary in order to secure continuity of action and under Dr. Dana's

leadership the Committee was able to secure funds for this purpose. From that time until 1925 the Committee was able to carry on this work only because the Chairman, Dr. Dana, was able to secure donations for its support.

His untiring interest, clear mind and cool impartial judgment soon brought to the Committee a sense of stability. With the interest of the Academy and the Public Health Committee always at heart, Dr. Dana frequently brought his own wise judgment to bear in tempering the views of some of the younger and more impulsive members of the Committee and at other times showed unusual foresight in furthering a forward looking project which did not always have the immediate support of the members of the Committee. Under his leadership the Committee quickly acquired and has constantly maintained a very large and authoritative influence in public health and hospital matters. It has been able to do this particularly because of his insistence on a thoroughness in its study of problems and an impartial judgment based on facts. The example of his own idealism and high principles has served as a guiding light for his associates. Dr. Dana's activities through the Public Health Committee soon brought to him the respect, admiration and affection of a considerable number of the Fellows of the Academy who gave to him loyalty and unswerving support. Their admiration and respect were evidenced by the tributes paid to him at a complimentary dinner held at the University Club in 1926, at the end of his fifteen years of service as Chairman of the Committee.

It is with mingled feelings of regret and sadness that the Committee learned that Dr. Dana had decided to lay down the burdens of the important office at the end of the year 1928. The following resolution expresses the sentiments of the Committee:

Resolved that the members of the Public Health Relations Committee of The New York Academy of Medicine hereby tender to Dr. Charles Loomis Dana who for seven-

teen years and a half has been Chairman of this Committee, their expression of loyalty, admiration, respect and affection, and their appreciation and gratitude for his earnest endeavors and for his eminent and distinguished leadership as Chairman of this Committee, and express the hope that he will continue as a permanent member of the Executive Committee.

COUNCIL NOTES

At a meeting of the Council held January 30, 1929, the publication of the following resolutions passed at a meeting of the Trustees held on January 30, 1929, was authorized:

ACKNOWLEDGMENT OF ENDOWMENT

RESOLVED, that the Board of Trustees of The New York Academy of Medicine hereby acknowledges receipt of \$500,000. from the Rockefeller Foundation making a total of \$1,000,000. received to date on account of endowments and the sum of \$12,500. for expenses toward the educational work of the Academy for the year 1928. The Trustees desire to record again their deep appreciation of the grants made by the Rockefeller Foundation, and it was also

ACKNOWLEDGMENT OF DONATION

RESOLVED, that the Board of Trustees and the Council of the Academy hereby request that Dr. John A. Hartwell transmit to his anonymous friend the very deep appreciation of the Board and Council of his generosity and to assure him that were it not for this donation the work in the Library would be seriously handicapped.

MEDICAL BROADCASTING

A report of the Committee on Discipline and Medical Information Bureau was read at a meeting of the Council held February 28, and the following recommendations were approved:

That the Academy approve of Fellows giving addresses over the radio on medical subjects, provided that the subject matter be typewritten and submitted to the Medical Information Bureau for editing and approval at least two weeks prior to the giving of the address.

That when such address is given, it be announced that it is given with the approval of The New York Academy of Medicine.

That when the time of the Health Speakers Service is available, the Academy approve of addresses being made under these auspices.

That when radio time is offered by industrial corporations, the Medical Information Bureau consider each case on its merits, and that no Fellow should give a radio address under commercial auspices without the approval of the Medical Information Bureau.

RESOLUTION OF THE COUNCIL ON THE DEATH OF DR. WIDAL

The Council of The New York Academy of Medicine has learned with regret of the death of one of its Honorary Fellows, Dr. Georges Fernand Isidore Widal, who died in Paris on January 14, 1929. Dr. Widal was one of the most prominent medical practitioners in France and had made for himself a remarkable reputation by his reports on the more accurate diagnosis of typhoid fever and by his studies in pathogenesis of edema. Dr. Widal passed successively through the medical hierarchy of Paris, beginning first as intern, becoming a demonstrator of pathological anatomy and giving practical courses in bacteriology at the laboratory of Professor Cornil. Dr. Widal was Professor of Medicine at the Faculté of Paris until his death, and during this period was constantly at work at the Cochin Hospital. Dr. Widal's report on the diagnosis of typhoid fever by the Widal test in 1896, gave him world-wide fame. This work was supplemented by his determining the specificity of suppurative processes in typhoid fever. His work with Lemierre on the role of sodium chloride and the production of edema of nephritis and heart disease was also one of distinct value.

In view of the important services which Dr. Widai rendered to his profession and to the public, the Council of The New York Academy of Medicine records its sense of loss, and be it hereby

RESOLVED, that a copy of this minute be spread upon the minutes of the Council and published in the Bulletin of the Academy, and be it further

RESOLVED, that a copy of this minute and resolution be transmitted to the Academy of Medicine in Paris.

RECENT ACCESSIONS TO THE LIBRARY

- Bailey, E. H. S. & Bailey, H. S. Food products; their source, chemistry and use.
3. ed., Phil., Blakiston, [1928], 563 p.
- Berger, A. The principles and technique of the removal of teeth.
Brooklyn, Dental Items of Interest Pub. Co., 1929, 350 p.
- Beyer, D. S. Industrial accident prevention.
3. ed., Boston, Houghton, 1928, 433 p.
- Bolduan, C. F. Public health and hygiene.
Phil., Saunders, 1929, 312 p.
- Borst, M. & Königsdörffer, H., Jr. Untersuchungen über Porphyrrie.
Leipzig, Hirzel, 1929, 281 p.
- Bramwell, J. M. Hypnotism; its history, practice and theory.
3. ed., London, Rider, 1921, 480 p.
- Brooks, H. Angina pectoris.
N. Y., Harper, 1929, 164 p.
- Burgess, M. A. Nurses, patients, and pocketbooks.
N. Y., 1928, 618 p.
- Canton, E. Historia de la medicina en el Río de la Plata.
Madrid, 1928, 6 v.
- De Vecchi, P. A discourse on divorce and its shameful abuse.
N. Y., privately printed, 1928, 68 p.
- Dodd, J. M. Autobiography of a surgeon.
N. Y., Neale, 1928, 323 p.
- Eisendrath, D. N. & Rolnick, H. C. Text-book of urology.
Phil., Lippincott, [1928], 942 p.
- Evans, C. H. Spinal anesthesia.
N. Y., Hoeber, 1929, 203 p.
- Feelings and emotions. The Wittenberg symposium. Edited by M. L. Reymert.
Worcester, Clark Univ. Pr., 1928, 454 p.
- Feer, E. The diagnosis of children's diseases.
2. ed., Phil., Lippincott, [1928], 551 p.
- Fisher, I. Prohibition at its worst.
N. Y., Alcohol Information Committee, 1928, 358 p.
- Gilchrist, H. L. A comparative study of world war casualties from gas and other weapons.
Wash., U. S. Gov. Pr. Off., 1928, 51 p.
- Greenwood, (Sir) G. The law of death certification.
London, Milford, 1928, 83 p.
- Groves, E. R. & Groves, G. H. Parents and children.
Phil., Lippincott, [1928], 196 p.
- Hamer, (Sir) W. Epidemiology, old and new.
London, Paul, 1928, 180 p.
- Hodgman, C. D. & Lange, N. A. Handbook of chemistry and physics.
Cleveland, Chem. Rubber Pub. Co., [1928], 1214 p.

- Hoffman, F. L. Some problems of longevity.
Chic., Spectator, [1928], 180 p.
- Jastrow, J. Keeping mentally fit.
N. Y., Greenberg, [1928], 297 p.
- Jerman, E. C. Modern X-ray technic.
St. Paul, Bruce, 1928, 260 p.
- Kennedy, E. Partial denture construction.
Brooklyn, Dental Items of Interest Pub. Co., 1928, 472 p.
- Köhler, A. Röntgenology.
N. Y., Wood, 1928, 556 p.
- Kossel, A. The protamines and histones.
London, Longmans, 1928, 107 p.
- Kraemer, H. Kraemer's scientific and applied pharmacognosy.
3. ed., N. Y., Wiley, 1928, 893 p.
- Little, M. E. & Kempton, R. T. A laboratory manual for comparative anatomy.
N. Y., Macmillan, 1928, 286 p.
- Maranon, G. The climacteric.
St. Louis, Mosby, 1929, 425 p.
- Marston, W. M. Emotions of normal people.
N. Y., Harcourt, 1928, 405 p.
- Montague, J. F. The modern treatment of hemorrhoids.
2. ed., Phil., Lippincott, [1928], 298 p.
- Morgan, T. H. The theory of the gene.
Rev. ed., New Haven, Yale Univ. Pr., 1928, 358 p.
- Neustaedter, M. Textbook of clinical neurology.
Phil., Davis, 1929, 602 p.
- Newman, (Sir) G. Citizenship and the survival of civilization.
New Haven, Yale Univ. Pr., 1928, 254 p.
- Nordenskiöld, E. The history of biology.
N. Y., Knopf, 1928, 629 p.
- Ottolengui, R. Table talks on dentistry.
Brooklyn, Dental Items of Interest Pub. Co., 1928, 488 p.
- Pearse, A. S. & Hall, F. G. Homoiothermism.
N. Y., Wiley, 1928, 119 p.
- Pruitt, M. C. Injection treatment of internal hemorrhoids.
St. Louis, Mosby, 1929, 137 p.
- Raynes, F. W. Domestic sanitary engineering and plumbing.
3. ed., London, Longmans, 1928, 490 p.
- Renaud, M. L'utilisation rationnelle du lait en thérapeutique.
Paris, Masson, 1928, 54 p.
- Riddell, W. R. Hieronymus Fracastorius, and his poetical and prose works on syphilis.
Toronto, Candian Social Hygiene Council, 1928, 136 p.
- Robinson, A. & Jamieson, E. B. Surface anatomy.
N. Y., Wood, 175 p.

- Sanger, M. Motherhood in bondage.
N. Y., Brentano's, 1928, 446 p.
- Schiff, F. Die Technik der Blutgruppenuntersuchung.
2. Aufl., Berlin, Springer, 1929, 91 p.
- Souttar, H. S. The art of surgery.
London, Heinemann, 1929, 624 p.
- Tanner, F. W. Practical bacteriology.
N. Y., Wiley, 1928, 235 p.
- Walker, S. H. Social work and the training of social workers.
Chapel Hill, Univ. of N. C. Press, 1928, 241 p.
- Warner, H. C. Prohibition, an adventure in freedom.
Westerville, O., World League Against Alcoholism, [1928], 265 p.
- Wiggers, C. J. The pressure pulses in the cardiovascular system.
London, Longmans, 1928, 200 p.
- Williams, J. F. Topical sources for "personal hygiene applied".
Phil., Saunders, 1929, 97 p.
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PROCEEDINGS OF ACADEMY MEETINGS

MARCH

STATED MEETINGS

Thursday Evening, March 7, at 8:30 o'clock

Program presented in cooperation with the Section of Neurology and
Psychiatry

ORDER

- I. EXECUTIVE SESSION
Election of Fellows
- II. PAPERS OF THE EVENING
 - a. The role of the medical expert in criminal trials, Foster Kennedy
 - b. Social danger of the borderline mental case, C. Floyd Haviland
Discussion, Hon. Cornelius F. Collins, Judge of the Court of General Sessions of the County of New York (by invitation), Hon. William McAdoo, Chief City Magistrate of the City of New York (by invitation), Frankwood E. Williams
- III. EXECUTIVE SESSION—SECTION OF NEUROLOGY AND PSYCHIATRY
Appointment of Nominating Committee

- b. Chemical studies of spinal fluid in meningitis, read by John A. Killian, Ph.D. (by invitation), Theresa Garcia, B.A. (by invitation)
Discussion, Roger H. Dennett, Augustus Wadsworth
- c. Pathology of "Acute Pyelitis" in infancy, James R. Wilson (by invitation)
- d. Persistent pyuria in infancy and childhood, read by John D. Lyttle, Pearl Summerfeldt (by invitation), Meredith F. Campbell
Discussion, Linnaeus E. La Fetra, Edwin Beer
- II. EXECUTIVE SESSION
Appointment of Nominating Committee

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, March 15, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF APPARATUS
 - a. A new apparatus for the immobilization of the head and neck in fractures of the cervical spine (Lantern slides), Samuel S. Hanflig (by invitation)
- III. PAPERS OF THE EVENING
 - a. A resumé of the osteochondritides, Joseph Buchman (by invitation)
 - b. Coxa plana—the course of the disease, Arthur T. Legg, Boston (by invitation)
- IV. DISCUSSION
Percy W. Roberts, Benjamin P. Farrell, Leo Mayer, Alan DeF. Smith
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION
Appointment of Nominating Committee

SECTION OF OPHTHALMOLOGY

Monday Evening, March 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. CLINICAL CASES
- III. DEMONSTRATION
Working model of eye muscles for teaching purposes, Wendell L. Hughes, discussed by J. W. Smith
- IV. SOME PRACTICAL POINTS IN THE ADMINISTRATION OF TUBERCULIN
Else A. Barthel (by invitation), discussed by M. J. Schoenberg
- V. PAPERS OF THE EVENING (9 p.m.)
 - a. The management of non-inflammatory glaucoma, including the results of treatment by injection of adrenalin and the use of glaucosan, Walter R. Parker, Detroit (by invitation), discussed by William Zentmayer, Arnold Knapp, Ernst Waldstein

- b. The intravenous use of hypertonic solutions as a routine pre-operative measure in glaucoma, Robert K. Lambert (by invitation)
Discussion, Julius Wolff, Joseph H. Globus

VI. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF MEDICINE

Tuesday Evening, March 19, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. The etiology of arteriosclerosis, Eli Moschowitz
- b. The dynamics of the circulation in essential hypertension and its bearing on therapeutics, Soma Weiss, Thorndike Memorial Laboratory, Boston City Hospital (by invitation)

II. DISCUSSION

Lewis A. Conner, Emanuel Libman, Walter W. Palmer

III. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, March 20, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Congenital cyst of urachus—lantern slides, Samuel Lubash (by invitation)
- b. Tuberculous stricture of urethra, Paul W. Aschner

III. PAPERS OF THE EVENING

- a. The pathogenesis of renal tuberculosis, E. M. Medlar (by invitation)
- b. The diagnosis and treatment of renal tuberculosis, Edwin Beer

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

Discussion of cases and papers is limited to Fellows of the Academy and specially invited guests.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, March 26, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

(From the clinic of the Woman's Hospital)

- a. Dermatitis following packing with iodoform gauze, Nelson Sackett (by invitation)
- b. Pregnancy complicated by amyotrophic lateral sclerosis, Arthur Murphy (by invitation)

Discussion, Asa Barnes Davis, George Arthur Blakeslee (by invitation), Hervey C. Williamson

III. PAPER OF THE EVENING

Observations on the results obtained in the treatment of sterility, Brooke M. Anspach (by invitation)

Discussion, Robert L. Dickinson, Isidor C. Rubin, Wm. Hollenback Cary (by invitation)

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

The discussion of papers and cases is limited to Fellows of the Academy and specially invited guests

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, March 27, at 8:00 o'clock
(Please note change of hour)

ORDER

MEDICAL CENTER AND POLYCLINIC HOSPITAL NIGHT

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Giant cell sarcoma of mandible
- b. Plastic repair of cheek, nose, mandible and superior maxillary bone
- c. Plastic repair of ala of nose
- d. Unilocular cyst of mandible
- e. Rhinoplasty
- f. Bone graft of mandible for recurrent adamantinoma, Henry Sage Dunning, Douglas Burnett Parker (by invitation)

III. REPORT OF CASES

- a. Exophthalmos due to chronic abscess of orbit and chronic frontal sinusitis, Cornelius G. Coakley
- b. Recurrent tracheal stricture, John D. Kernan
- c. Recurrent polypi of maxillary sinus in a boy of eight years, James W. Babcock
- d. Dilatation of esophagus with spasmodic stricture, George H. Brighton (by invitation)

- e. Composite tumor of pharynx
- f. Lymphosarcoma of tonsil, George V. Browne (by invitation)
- g. Report of 7 cases of nasal accessory sinus disease, Lee M. Hurd
Discussion, S. Fineman

IV. PRESENTATION

Anatomical specimens, Harry Neivert (by invitation)

V. PAPER OF THE EVENING

A new method of visual instruction. The use of still films in place of lantern slides, William W. Morrison

VI. EXECUTIVE SESSION

Appointment of Nominating Committee

FELLOWS ELECTED MARCH 7, 1929

Henry Charles Barkhorn.....	45 Johnson Avenue, Newark, N. J.
Pol. N. Coryllos.....	48 East 75th Street
Raymond Emory Meek.....	30 East 40th Street
Milton Joseph Raisbeck.....	310 West 85th Street
G. Canby Robinson.....	477 First Avenue

DEATHS OF FELLOWS OF THE ACADEMY

ERNST HERMANN ARNOLD, M.D., 1460 Chapel Street, New Haven, Connecticut; graduated in medicine from Yale University, New Haven, Connecticut, in 1894; elected a Fellow of the Academy December 6, 1906; died March 9, 1929. Dr. Arnold was Chief Orthopedic Surgeon to the Griffin Hospital, Derby; to the Grace Hospital, this city, and was Chief of the Orthopedic Dispensary, New Haven.

ABRAM SCHUYLER CLARK, M.D., 614 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1899; elected a Fellow of the Academy February 7, 1907; died, March 22, 1929. Dr. Clark was a Fellow of the American Medical Association, a member of the New York Dermatological Society, Visiting Physician to the Skin and Cancer Hospital, Consulting Dermatologist to Roosevelt Hospital, Hospital for the Ruptured and Crippled, Post Graduate Hospital, Lincoln Hospital, Beekman Street Hospital, St. Peter's General Hospital of New Brunswick and All Souls' Hospital, Morristown, New Jersey.

OTTO GLOGAU, M.D., 1130 Park Avenue, New York City; graduated in medicine from the University of Vienna, Vienna, Austria, in 1900; elected a Fellow of the Academy January 4, 1912; died, March 8, 1929. Dr. Glogau was a Fellow of the American Medical Association, a member of the American Academy of Ophthalmology and Oto-Laryngology and a member of the Oto-Laryngology Committee.

ORREN AUGUSTUS GORTON, M.D., West Hill, Sherburne, New York; graduated in medicine from New York University, New York City, in 1877; elected a Fellow of the Academy April 7, 1881; died, March 15, 1929.

WILLIAM BENJAMIN WOOD, M.D., 5593 Beacon Street, Pittsburgh, Pennsylvania; graduated in medicine from New York University, New York City, in 1881; elected a Fellow of the Academy June 4, 1885; died, March 16, 1929. Dr. Wood was a Fellow of the American Medical Association.

DATES OF ACADEMY MEETINGS

STATED MEETINGS

1st and 3rd Thursdays.

SECTION MEETINGS

Dermatology and Syphilis, 1st Tuesday.

Surgery, 1st Friday.

Neurology and Psychiatry, 2nd Tuesday.

Pediatrics, 2nd Thursday.

Otology, 2nd Friday.

Ophthalmology, 3rd Monday.

Medicine, 3rd Tuesday.

Genito-Urinary Surgery, 3rd Wednesday.

Orthopedic Surgery, 3rd Friday.

Obstetrics and Gynecology, 4th Tuesday.

Laryngology and Rhinology, 4th Wednesday.

Historical and Cultural Medicine, 2nd Wednesday of November, January, March and May.

TRUSTEES, COUNCIL AND COMMITTEE MEETINGS

Trustees, 4th Wednesday.

Council, 4th Wednesday.

Committee on Admission, 1st Wednesday.

Committee on Library, 2nd Tuesday.

Public Health Relations Committee, Mondays.

Committee on Medical Education, 2nd Thursday.

Committee on International Medical Relations, 3rd Wednesday.

DONATIONS TO THE LIBRARY FUNDS

Donations and bequests are solicited by The New York Academy of Medicine for the maintenance and expansion of the Library.

A donation or bequest of \$5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate.

FORM OF BEQUESTS

The following is a brief legal form as a suggestion under which bequests may be made in behalf of the Academy:

I give, devise and bequeath unto "The New York Academy of Medicine" of the City of New York, State of New York, a corporation duly incorporated by the Legislature of the State of New York by an act entitled, "An Act to Incorporate The New York Academy of Medicine," passed June 23, 1851, and amended June 4, 1853, June 2, 1877, and April 24, 1925,.....

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V.

MAY, 1929

No. 5

EDITORIAL

A MEDICAL TOUR IN THE WEST

Appreciation of the West came early in our national life, as is plain from its rapid settlement, expansion and development. The Golden Gate, the Grand Cañon, the Yosemite, the Yellowstone Park, the Sierras, the Enchanted Mesa, the habitat of the cliff-dwellers, the lake-shore region are among the showplaces of the world, the admiration of all European travellers. The Swiss, who are specialists in scenery, say that Americans cannot appreciate it because they have so little of it; but in the West, the case is surely different. The upward sweep of the prairie toward the horizon suggests the passage in AEschylus which depicts the morning uprush of mighty waters on the verge of some far Eastern ocean—

“As a wind at dawn dashes waves in the face of the sun,”¹

and is so described by Miss Cather (“as the plains of Lombardy rise to the sun”) and latterly by Paul de Kruif (“prairie interminable like the ocean, strange dun-colored land without a break on all sides sweeping up grandly to meet the horizon rim—like the ocean”).

To the tired professional man of our overcrowded Eastern cities, the West has become the great stamping ground for rest and recuperation by very real recreation in an entirely different *milieu*. A fair ensample of recent sentiment is the charming paragraph of Thayer:

¹ AEschylus: Agamemnon, 1180-1183. The phenomenon is implicit in Kipling's mighty line (“And the dawn comes up like thunder out of China, 'cross the bay”) and has to be seen to be appreciated.

"In not one of the last twelve years have I missed a glimpse of Western mountain and plain, and the homesickness that I feel so often during the winter for the broad, free spaces, for the rushing rivers and clear lakes, for the jack pine and the quaking asp and the sage brush, the rosy gleam of the peak at sunrise and the purple glow of the mountain-side at sunset, and that crystal air through which the sun shines, ever warm, and the moon and the stars become one's neighbors—the homesickness that I feel for all this now, and for a people who speak my language, has made me ask more than once: Where is home after all?"²

Here, indeed, is and has been our one great outlet for romantic enterprise, whether it spelled opportunity for testing the Beaconsfieldian "Adventures are to the adventurous"; for escape from the stupefying trammels of an outworn environment; for change and perhaps improvement of fortune; for recovery of health or for the development of physique, stamina, hardihood, resolution, self-reliance, initiative and the high courage which is ever the portion of your "good loser." Physicians, bored and pestered by the captious importunities of *malades imaginaires*, are fain to send them anywhere and everywhere, from Maine to Florida, from Banff to the Riviera, haply from Sitka to Yalta, knowing that in such cases simple change of scene is a therapeutic device more effective than devil-devil drugging, diathermy, dietetics or other *dynamidia*. Several adoptive Westerners have admitted to the writer that they left the East mainly as a lithe perpetual escape from honey-fugling by maiden aunts, from the overweening concern of parents as to the future of their offspring in this world and the next, from the tedious high-hatting, pragmatistical bluster and insufferable meddling of pompous elders of true Victorian breed, but above all, to get away to themselves in the West, "where there were not so many people and plenty of room to turn around in." The general feeling was that a man may be (and probably is) his own worst enemy but the biggest nuisances about him are oftentimes his neighbors and relatives—a common private sentiment of Victorian Englishmen. The fundamental aim was essentially right and wholesome—to get away from apron-stringing and develop a manly character. The type

² W. S. Thayer: *Jour. Am. Med. Ass.*, Chicago, 1928, xc, 1917.

most envied in this particular period was the Western hero of Bronson Howard's "Aristocracy"—a waif from an Indian massacre, who had not a single known relative in the world and thus stood alone and incidentally quite on his feet. The necessary appanage of the essential pioneer was detachment of mind and independence of character, without which there would have been no Declaration of Independence. To people of enterprising, independent self-reliant type, "going West" meant to cut one's moorings, slip one's cable, break with one's past and head for the open. In this great process of the settlement of a continent, the term "West" acquired a certain ambiguity; for directly Plymouth or Jamestown colonists began to move inshore, to explore the backwoods and the hinterland, they were already "going West," sometimes in the pathetic sense of the Western Front. At intervals during the half-century following the Revolution, Western Pennsylvania, and New York, Ohio, Kentucky, Indiana, Illinois, Iowa were all in turn the "far West," an implication which the coast, mining and cattle states did not acquire until well after the discovery of gold. The process was a gigantic *Verschiebung*; but in earlier days, when Maine was still owned by Massachusetts and West Virginia, Kentucky, Ohio, Indiana, Illinois and Wisconsin were still part of the Old Dominion, such centers as Chicago or Minneapolis were not even military posts. In the words of McMaster:

"That splendid section of our country drained by the Ohio and the Tennessee was one vast solitude. Buffaloes wandered in herds over the rich plains now the granaries of Europe. Forests of oak and sycamore grew thick on the site of many great and opulent cities whose population now exceeds that of Virginia during the Revolution, and whose names are spoken in the remotest corner of the civilized world. No white man had yet beheld the source of the Mississippi river. Of the country beyond the Mississippi little more was known than of the heart of Africa. Now and then some weather-beaten trapper came from it to the frontiers of the States with stories of great plains as level as the floor, where the grass grew higher than the waist, where the flowers were more beautiful than in the best kept garden, where trees were never seen and where the Indians still looked upon the white man as a god. But the country lay far to the west of the

frontier, and the frontier was wilder then than Wyoming is now. There the white man lived in an unending war with the red man."³

As the first Western settlements were, in the nature of things, military stations, so the first doctors on the spot were medical officers of the Army, who played a creditable, manful part in the nursing of these infant communities through their ailments, even the delivery of their actual babies, until they were adult enough to develop medical resources of their own. With the great throngs of emigrants that followed, by covered wagon or flat-boat, over the Mohawk or the Ohio Valleys or the Cumberland Pike, there necessarily went a few doctors, some of them best described, in Billings' memorable phrase, as "certain persons calling themselves physicians," of dubious education and inferior in ability to the native Indian herbalists. The *impetus faciens* of the great westward trek was usually compounded of two forces, poverty and pelf. The push was hard times in Europe and on the Atlantic seaboard; the pull was the allure of taking a chance to improve one's fortune. The salient feature was impermanence. The pioneer, a restless, dissatisfied being from the start, was often driven by loneliness, poverty and failure to push on, lose himself and die in the wilderness. The Army surgeon, in a thriving settlement, often resigned his commission to take up civilian practice. The emigrant doctors often went into politics, real estate speculation or some other nimble-shilling business, until enough patients materialized to guarantee a livelihood. The ablest of these pioneer physicians were the backwoods surgeons, among whom are numbered such names as McDowell, Dudley, Brashear (amputation at hip-joint, 1806), McCreary (first successful excision of clavicle, 1810), Richmond (first successful Caesarean section, 1827), Daniel Brainard, founder of Rush Medical College and of Chicago medicine, Wolcott (first successful nephrectomy, 1861) and Bobbs (first cholecystotomy for gallstones, 1868). In internal medicine and medical education, the great centric figure before

³ J. B. McMaster: *History of the People of the United States*, New York, 1915, I, 5.

the Civil War was Daniel Drake, whose study of the Diseases of the Mississippi Valley (1850-54) still remains an unapproachable classic in topographical medicine. In the second half of the century, the "far West" gradually recedes to the Pacific coast, where settlement was vastly accelerated by the discovery of gold in California (1849) and the consequent development of the great railroad systems (Baltimore and Ohio, 1853; New York Central, 1853; Illinois Central, 1855). The total Mississippi Valley, including the northern lakeshore states (the "Old Northwest") then became the Middle West; the "open range" or "cow states" comprised Western Montana, Colorado, Wyoming, Nebraska, Western Kansas and Texas; the mining area covered Idaho, Colorado, Nevada and California; the granger region comprised Illinois, Minnesota, the Dakotas, Utah, and Eastern Montana; while Texas and New Mexico, were "sheep states" and the old Northwest (Michigan, Minnesota, Wisconsin) with Idaho, Washington and Oregon were also devoted to lumbering. There were no farms between Nebraska and the Sierras; everything from Kansas to Colorado and from Mexico to Canada was a gigantic cattle-range; "between the Missouri and the Sierras there was practically nothing but cattle and minerals."⁴ The salient feature of this colonization, of the great *trek* of covered wagons over the Oregon and Santa Fe trails, was again impermanence. The kind of doctoring that went to the mining and lumber camps, the cattle range and the great wheat fields, is disappearing with the miner, the cow-boy and the lumber-jack. In the earlier settlements, the Middle Western States never quite lost touch with the East and thus grew in political power and national importance as time went on. In each of these states, medicine and medical education were fairly developed by the end of the 19th century. Illinois, Indiana, Iowa, Missouri, Michigan, Minnesota and Wisconsin have each a definite medical history all its own, and now in process of intensive development by use of the medical records and co-operation with the *custodes rotulorum* of

⁴ Katherine F. Gerould: *The Aristocratic West*, New York, 1925, 16-18.

the several State historical societies. But the pioneers over the Oregon and Santa Fe trails deliberately severed the umbilical cord and put thousands of miles between themselves and the Eastern Seaboard.⁵ With the exception of California, the medical history of the far Western states is mainly a series of anecdotes about the hardships and hazards attending the doctoring of Indians, black-shirted miners, cowboys, sheep-men, lumber-jacks, outlaws and desperadoes. In the strict sense, they have had, as yet, no medical history. Up to the end of the 19th century, the medical culture of the receding West was mainly supplied by Army medical officers and educated emigrant doctors from the East, and, as an ironic Minnesota physician observed to me, even the road-agents, cattle-rustlers, train-robbers, mining sharks, outlaws, desperadoes and oddfish, "were, in the first instance, Eastern men." An amusing tradition among Army files of the period was to the effect that the pious birds floating around New England villages and Southern religious revivals, lank and hypocritical of mien, in clerical-cut coats and choker collars, were fain to become "regular desperadoes" and "booze-fighters" when they let themselves loose in the West. In the 20th century, and particularly after the Spanish American War, there was a remarkable turn-about. Where formerly Daniel Drake went to Philadelphia to complete his medical studies and the founders of Rush Medical College stemmed, every one of them, from the Fairfield (New York) School, we now see eminent Western physicians functioning in the East as organizers and teachers. Billings, upbuilder of the Surgeon General's Library and a *poies* or maker of American medicine in the truest sense, had his headquarters in Washington. Cushing (Ohio), Cannon (Wisconsin), Porter (Ohio) and Streeter (Illinois) are at Harvard and Weed (Ohio) is Dean of the Johns Hopkins Medical Faculty, which includes Abel (Ohio), McCollum (Kansas), Dean Lewis (Illinois) and Hugh Young (a Texan). But *Minerva medica*, as Osler observed, is an impartial, whimsical goddess. Using Philadelphia as a jumping-off

⁵ Gerould: *op. cit.*, 130.

place, she has flitted variously and capriciously to Charleston, Boston, New York, Fairfield (N. Y.), Cincinnati, Lexington, St. Louis, Baltimore and Chicago—the historic nuclei of medical education in our country.

In November, 1928, through the courtesy of Dr. Louis B. Wilson of the Mayo Foundation, I was privileged to give a series of lectures in a number of the Western States which, incidentally, afforded an unique opportunity to see and study at first hand the remarkable developments of medical education in some of the newer centers. A brief account of these may be of some interest.

CLEVELAND

Leaving Washington on election night (November 6), the population of our sleeper did not learn the result of the momentous contest until the next morning, but the extent of concern about our quadrennial set-to was evidenced by the rays of carbon light which streamed from the berths down the aisle through the night. Our immediate destination was a stop-off at Cleveland to attend a meeting of the Cleveland Medical Library Association *en route*.

Cleveland is a good example of the kind of going medical center one finds so frequently through the present "middle West." The School of Medicine of the Western Reserve University, originally the Cleveland Medical College (1843), known also as Hudson Medical College, acquired its present status as the Medical Department of the University in 1913, after fusion with the Medical Department of Wooster University (1881) with subsequent absorption of the Cleveland College of Physicians and Surgeons (1910), and has been co-educational since 1919. This tendency toward centralization *via* slightly dispersed units is further helped out by the acquisition of the unique and spacious Pathological Institute, the façade of which through the historic feeling of its organizer and director, Professor Howard T. Karsner, has been decorated with

bas-relief portraiture of eminent pathologists and reproductions of the coats of arms of the medical and surgical guilds of the Middle Ages. The splendid hospital, now in process of construction, will add another unit to this University medical center, which will ultimately include maternity and infants hospitals, medical, dental and research laboratories, and a new building for the medical school, as fast as new buildings can be erected to displace the old. To this end, also, the Cleveland Medical Library Association (organized 1893) acquired from the University a near-by site for a new building at the corner of Euclid Avenue and Adelbert Road. This was opened on November 13, 1926, as the Allen Memorial Medical Library, with a dedicatory address by Dr. Harvey Cushing. The new library is a handsome building of limestone and marble, with bookstacks of 125,000 volume capacity, a hallway decorated with mural paintings, the spacious Cushing and Powell memorial reading rooms, an assembly hall seating 600, a lecture room seating 95, a dining room and kitchen and the headquarters of the Cleveland Academy of Medicine. The general relation and locale of the Library with reference to the University Medical Center is similar to that of the Welch Memorial Library with reference to the Johns Hopkins Hospital and School or of the Library of The New York Academy of Medicine with reference to the New York Medical Center.

CHICAGO

A far different impression is gained from the Northwestern University Medical School, now housed in a single massive building, surmounted by an imposing tower, on the Alexander McKinlock Memorial Campus at the junction of Chicago Avenue and the Lake Shore Drive. Here, as in the newer hospitals of sky-scraper or broad-acre type, the tendency is away from the decentralization *via* dispersed units toward extreme unification and concentration. Apart from the fact that decentralization of any kind makes for hitches in administration, as with the multiplex surgeon-generalcies in the armies of Frederick the Great

or Washington, this extreme concentration in one building offers overwhelming advantages with regard to the rigors of Western winters and has been carried out effectively in the new medical buildings at the Mayo Clinic (Rochester), Madison and Iowa City. In periods of heavy snow, sleet or rain, engagements will be more promptly and strictly kept and more work will get itself done, if centralized in a single plant, under the eye of one responsible chief, than under the dispersoid arrangement. The Northwestern School started as the Medical Department of Lind University, under the guidance of such prime movers as Nathan Smith Davis, Nestor of Medical Chicago, Ralph N. Isham, William H. Byford, Hosmer A. Johnson and Edmund Andrews, and was opened on October 9, 1859. In 1864, it acquired an independent status as the Chicago Medical College, became affiliated with the Northwestern in 1869 and an integral part of that University in 1905. A fifth year, spent in hospital, was added to the curriculum in 1915 and the school has been co-educational since 1926. Since July 1, 1925, it has been directed by the genial Dr. Irving S. Cutter, of Keane, New Hampshire, an able botanist, biochemist and medical historian, who taught physiological chemistry in the University of Nebraska (1910-25) and was the dean of its Medical School during the decade 1915-25. In this huge central teaching plant of the Northwestern, each floor is devoted to a separate discipline or specialty; each main hallway is lined with an impressive array of historical engravings and portraits illustrating these subdivisions of medicine; every room of consequence is occupied with students in class, at dissecting, post-mortem or laboratory work or engaged in some phase of office practice of medicine. There is everywhere a hum of quiet activity which would have delighted Billings, who reasoned that wherever people are keenly occupied with business exclusively their own, there is little opportunity for idling, intrigue, gossip or general mischief-making. "Satan finds plenty for idle hands to do." In no educational institution that we have seen is the spirit of

historical medicine more closely interwoven with the teaching of its principles and practice. There is no separate chair of the subject but it speaks from the very walls. The Archibald Church library is singularly rich in historical treasures. The collection, latterly acquired by Dean Cutter from Edinburgh and Glasgow, comprises many basic but little known minor classics of English medicine which it was a treat to see for the first time. He knows the contents and significance of every one of them and it was a source of inspiration to hear him discuss them.⁶

The limited time at our disposal being taken up with engagements at the Northwestern School, it was not possible to see the medical buildings of the University of Chicago (Rush Medical College), of the University of Illinois (College of Physicians and Surgeons) or of Loyola University (fusion of Bennett Medical College and the Chicago College of Medicine and Surgery), but a word as to the present status of the first seems apposite. Rush Medical College, the creation of Daniel Brainard, was chartered in 1837, organized in 1843 and opened in 1844. It became the Medical Department of Lake Forest University in 1887, was affiliated with the University of Chicago in 1898 and became an integral part of the University in 1924. Like the Northwestern, it took on a fifth year of hospital internship in 1914, but has been co-educational as far back as 1898. Its dean is the well-known clinician, Dr. Ernest E. Irons. This school labors at present under some of the disadvantages of decentralization, consisting of two separate institutions on the South and West Sides, in which under-graduate instruction is virtually duplicated. When fusion with the Rush Medical College (West Side) was definitely effected in 1924, the University of Chicago (South Side) put up handsome new buildings on the college campus, with the idea of maintaining a school of post-graduate instruction, like that of Vienna, at Rush,

⁶ Dr. Cutter is publishing in *The International Abstracts of Surgery*, a series of "Landmarks of Surgical Progress," which, if completed and collected, will make a definite source-book of the major advances in the history of surgery.

while undergraduate teaching would be confined thereafter to the University. But, inasmuch as obstetrics, pediatrics and some other departments of the centric university plant on the South Side have not yet been installed, the original plan has not been carried out to date. The South Side school gives most (not all) of the third and fourth year courses and encourages research work, while West of the Chicago River, the Rush Medical College, with the Presbyterian Hospital (450 beds) adjoining, Cook County Hospital (3000 beds) only a block away, and superabundant clinical material coming in from the adjacent slums, continues to give the curriculum (including third and fourth years) in full, stressing particularly an adequate preparation for practice of medicine.

The old historic clinical building of Rush was thrown down in 1924, to be replaced by the Raouson Clinical Laboratory and the Norman Bridge Laboratories of Pathology. The adjoining Sena Laboratory building was erected in 1903 and affiliation with the Children's Memorial Hospital was secured in 1908. But it takes something more than hospital affiliation and steady maintenance of clinical material to activate and substantify post-graduate instruction.

MADISON

"Four limpid lakes, four Naiades,
Or sylvan deities are these,
In flowing robes of azure dressed;
Four lovely handmaids that uphold
Their shining mirrors, rimmed with gold,
To the fair city of the West."

Thus Longfellow on the beautiful city by enchained four lakes, which form the headwaters of Rock River, a tributary of the Mississippi, flowing southward through Illinois. Madison occupies the isthmus of wooded hills between Lakes Mendota and Monona, an ideal site for a quiet university town. The university grounds occupy an undulating wooded area on the South shore of Lake Mendota. On the summit of University Hill, 125 feet above the lake,

is the main building; at the base, the elaborate structure which houses the libraries of the State Historical Society and the University. On another hill, embowered among trees, is the State Capitol. Even in the late autumn, this combination of wooded hillside and lakeside conspired to make Madison seem one of the most attractive university towns in the world. The Medical School of the University was organized as late as 1907, with the professor of anatomy, Dr. Charles R. Bardeen, as dean. The new medical building, just completed, leads directly, by covered passage-way, into the massive structure of the new Wisconsin General Hospital, so that medical teaching, in all phases, will be concentrated, as at the Northwestern (Chicago), in one housed area, which also affords quarters for the laboratory activities of the public health service of the State. These installations were in process upon our arrival, but hospital activities were in full swing, and the medical library, the best lighted in the country, was already a going concern in the central building. The immense attendance of students at these Western universities could be sensed from an intercollegiate football game, which was the occasion for a general homecoming of alumni from all parts of the state, a never-ending processional of robust, young people through the crowded streets from noon to nightfall. Medical teaching here will probably assimilate to the Northwestern plan, instruction in practice of medicine being given in the General Hospital. In keeping with the general Wisconsin plan, service in hospital (gratuitous to the poor) and in the public health establishment is statewide. A visit was paid to the home of Professor William S. Miller, who held the chair of anatomy during 1895-1924 and since 1909 has held annually at his home an extramural *Seminar* for post-graduate advancement in the history of medicine. With the aid of a private library of 6000 volumes, this plan worked out so successfully that the students have presented annually a bound volume of their historical contributions (about 50 in all) to Professor Miller since 1913.

ROCHESTER

Rochester, Minnesota, settled in 1854 and chartered in 1858, is a medical center of comparatively recent growth, but, as the Mecca of organized surgery, it is now one of the best known and most important in the recent world. The story of the development of the Mayo Clinic around St. Mary's Hospital, a foundation of the Sisters of St. Francis, erected for Dr. William Wardell Mayo (1819-1911), is well known. It now handles some 65,000 patients annually in various hospitals, controls 1,345 active and 440 convalescent beds, and has a permanent staff of 155 members, 11 nurses, a non-permanent staff of 285 and some 1,100 extra personnel. So great has been the intake of actual and prospective patients, that the upper stories of no less than five hotels of the Kahler Corporation are now utilized to accommodate them. This is a new departure, yet in keeping with the original intention of the earliest hospitals, such as the Hôtel Dieu or the Hospice St. Bernard. As an efficient military establishment is like a well organized railroad system, so the ideal of hospital accommodation of patients should assimilate itself to that of a hotel, an ideal seldom realized. Of the Charité in Berlin, the satirical von Graefe observed that its patients "were privied like princes but fed like beggars." Checking on this epigram, Naunyn states that the wards and corridors were cleaner in the late sixties than at the end of the 19th century, the fare from the diet kitchen adequate and simple but too coarse for convalescents, the beds in the non-clinical wings hard and uncomfortable, the baths and water-closets deplorable, even in his days of internship (1863-9).⁷ A recent magazine article on hospitals,⁸ by an old newspaper man, enlarges upon the indifferent attention and lack of creature comforts which women approaching labor commonly endure in maternity hospitals and obstetric wards, *i.e.*, in the very situation in which a

⁷ B. Naunyn: *Erinnerungen, Gedanken und Meinungen*, München, 1925, 117.

⁸ C. T. Crowell: *Am. Mercury*, N. Y., 1928, XV, 275-281.

woman stands most in need of careful attention and delicate consideration. The sense of the article is that paying patients in hospital realize but little on their temporary investment. The question is one of administrative management, including finance, and doubtless something might be learned from the Rochester experiment with regard to accommodation of surplus patients, diet kitchen⁹ and organization of service.

In 1915, the Mayo Foundation was incorporated, with a gift of \$1,500,000 from Drs. Charles H. and William J. Mayo, the funds and resources of the Foundation being placed at the disposal of the regent of the University of Minnesota for the promotion of graduate work and research in medicine. On September 13, 1917 the Foundation became the definite post-graduate department of the University, the unfulfilled aspiration of the University of Chicago with reference to the hospitals and laboratories on the West Side. Post-graduate instruction in medicine and surgery had already been given since 1912, but under the new arrangement, not only is opportunity for advanced study and research guaranteed, but the candidate is salaried at the end of the year, very much like cadets at West Point or the Naval Academy. As the surplus earnings of the Clinic flow into this fund, we have here a self-perpetuating altruistic experiment never before realized in medicine.

⁹ The experiences of the late Count Witte, whose suite was victualled by the government at the Portsmouth Conference, moved him to say that "people live very poorly in America," an observation which becomes more intelligible in the light of James Huneker's epigram, that we have, by and large, "the best food and the worst cooking in the world." Yet this condition might be bettered, as it has been bettered from our frying-pan period to date, by a little enterprise, such as Ben Butler displayed when he sojourned in Europe to learn how to make bunting for our national flag. A good example of this enterprising spirit is patent in *The Questing Cook* by Ruth A. Jeremiah Gottfred (Cambridge, Mass., 1927), which suggests how much of careful experimentation and intensive thought has gone to the delicate, elusive art of cookery, both in Europe and Asia. The people who seem least concerned are those whose livelihood is gained by the management of cafés, cafeterias and hotels.

The whole success of the Foundation turns upon this broad communal spirit, which has permeated the entire atmosphere of Rochester, converting it into a virtual university town. Through the courtesy of Dr. Charles H. Mayo, whose innate, unassuming kindness of disposition has made him universally beloved, it was possible to see the laboratories and the new medical clinic, of which the massive, grilled iron gateway, of Italianate pattern, had just been swung into position. The laboratories, well stocked with experimental animals in the basement, have, wisely and fortunately, not been constructed on too large a scale, a condition which tends somehow to distraction and divided effort.¹⁰ From these originated many recent investigations in experimental surgery and the pathology of the digestive system which have become outstanding. The most remarkable results exhibited at the time of our visit were successful cases of operative treatment of Raynaud's disease by dorsal ganglionectomy and of polyarthritis by bilateral lumbar sympathetic ganglionectomy and ramisectomy, both performed by Dr. A. W. Adson.¹¹ The new medical clinic is a gigantic building of fourteen stories (with a five storied Tudor tower), connected with the old clinic by a corridor, and so arranged that all paper work (registration, records, statistics) is done on the first two floors, the next three being devoted to clinical specialties, the next floor to general diagnosis, the twelfth floor to the library, the thirteenth to mechanical equipment, while the floors above are assembly rooms and offices of the Division of Publications and the Mayo Foundation. The most striking feature of this arrangement is the large number of small separate rooms devoted to the examination of patients. This seemed the most salient, and at the same time, the most inspiring feature of Western clinical teaching—the sight of an endless array of students, all

¹⁰ One of the Western medical professors spoke of the "magnificent distances" of the immense unit in which his laboratory section was housed, as isolating him from stimulating and productive relationship with his colleagues in the same building.

¹¹ A. W. Adson & G. E. Brown: *Proc. Mayo Clinic*, Rochester, 1928, III, 266; L. G. Rowntree, *Ibid*, 333.

engaged in virtual office practice of medicine in innumerable little rooms. The experience gained with reference to the ethics and etiquette of general practice must alone be of inestimable advantage to the student, but what amazes most is the immense scale of this plan of teaching. The general spirit of the Mayo Foundation, that of plain living and high thinking, has pervaded all Rochester, which means an end of Main Street. Every hour of the working day is, or can be, occupied with clinical and laboratory work, medical meetings or special lectures, commonly delivered by European or American authorities. At the time of our visit, d'Herelle (Yale) was lecturing on bacteriophagy. Surgery is no longer the exclusive feature of the Clinic, and the Foundation is now so well coördinated that it renders post-graduate University teaching in all branches of medicine. The Rochester ideal has been well voiced by Dr. Charles Mayo:

"The safest thing for a patient is to be in the hands of a man engaged in teaching medicine. In order to be a teacher of medicine the doctor must always be a student."¹²

"The English physician gives reassurance to his patient in a greater measure than does the American physician; there is a stronger personal relation between him and the patient, with less emphasis on the material side of healing. In America, we are too often overly scientific, too prone to lose sight of the man in his relation to life and to see only the patient with the disease. To a considerable extent we leave reassurance to the quack and the cultist, and if we are unable to find physical disease we say that a patient needs no medical attention, although he may be urgently in need of reassurance and mental comfort."¹³

MINNEAPOLIS

Through the kindness of Professor Rowntree, we motored along the Mississippi to Minneapolis, a wonderful drive diversified by bits of Montana-like scenery (buttes) and the picturesque dwelling houses of the Scandinavians, with their steeple-like roofs of polychrome tiling and their crossed-hatched façades, like those of Swiss chalets. Like Madison, the capital of Minnesota is a city of beautiful

¹² C. H. Mayo: *Proc. Mayo Clinic*, Rochester, 1927, II, 233.

¹³ *Ibid.*, 168.

environs. Occupying both banks of the Mississippi at the Falls of St. Anthony, it is surrounded by a ring of lakes, which have been incorporated into a system of engaging and delectable parks. Of these, Minnehaha Park, with the famous cascade of Longfellow's Hiawatha, the Army reservation at Fort Snelling (1819), the Lake Minnetonka suburb and the University grounds on the East side are particularly memorable. The city is, at once, the leading railway terminal of the Northwest and the greatest flour and lumber center in the world. The Medical School of the University of Minnesota was organized in 1883, has absorbed by merger the St. Paul Medical College and the Minnesota Hospital College (1888), the Minneapolis College of Physicians and Surgeons (1908), the Homeopathic College of Medicine and Surgery (1909) and has latterly acquired, as its post-graduate department, the Mayo Foundation (1913-17). A fifth year course of interneship was added to the curriculum in 1910, and the school has been co-educational since inception. Among the memorial gifts are the Elliot Memorial Hospital, the George Chase Christian Memorial Cancer Institute, the Todd Memorial Pavilion and the Hospital (Campus) and Convalescent Home (West River Drive) for Convalescent Children, made possible by a donation of \$1,500,000 by William H. Eustis. With the continued acquisition of units such as these and with the Mayo Clinic now accessible by aëroplane, this school bids fair to be the most richly endowed in the West. The Botanic Garden of medicinal plants, attached to the School of Pharmacy, has already been obliterated to give place to a new building. The Medical Library, one of the best in the country, is housed in the General Library Building. The academic courses for undergraduate instruction are of most recent type.

IOWA CITY

In connection with engagements with the Des Moines Academy of Medicine, three delightful days were spent at the post at Fort Des Moines, which encircles a prairie parade ground "as level as a floor." We proceeded thence to

Iowa City, where the Medical Schools formerly at Keokuk (1850), Des Moines (Drake University 1882) and Sioux City (1887) have been merged with the College of Medicine (1870), to form the Medical Department of the University of Iowa (1913), now financed by the state, with generous endowments from the General Education Board and the Rockefeller Foundation. This fusion of the four (originally eight) separate medical faculties of Iowa into a single state supported institution is, like the Cleveland and Minneapolis departures, one of the most significant and important advances in Western medicine. The material advantages, in this case a guaranteed fund of \$4,500,000 (available since 1924) are self-evident, for by such means it was possible to construct the two magnificent units recently dedicated, *viz.*, the Medical Laboratories Building (1927), housing the Medical Library, the State Board of Health Laboratories, the preclinical departments, and the new General Hospital (1928). These, with the Children's Hospital (opened 1919), the Psychopathic Hospital and the spacious Westlawn quarters for nurses (1928), make up one of the most attractive and going assemblages of medical units in the total West. The Medical Campus, a tract of about eighty acres on the western bluffs of the Iowa River, commands a view of scenery which might be out of Wales, or some other favored short while, one of the most efficient and effective medical educational plants in the country has been developed in a way to add distinct architectural beauty and dignity to an unpretentious university town. The medical units are constructed of a brick of that neutral gray which speedily takes on an ivy-grown semblance and the tower of the General Hospital, like those of the Northwestern and the Mayo Clinic, reveals the Western penchant for the battlements of Tudor England. The interior walls are usually of this unplastered gray brick, a color scheme which seems not only sufficiently decorative in itself, but admits of knocking down, plastering or other alteration with a minimum expenditure of money and energy. The major unit (General

Hospital) will accommodate 700 patients, as follows: 16 large general wards of 20 beds each (320); surgery, 122 beds; medicine, 95; nose and throat, 61; neurology, 48; obstetrics, 41; gynecology, 45; genito-urinary, 42; eye, 30; isolation, 61; women's venereal, 34; men's venereal, 23; dermatology, 16; semi-private, 50; private, 47. The administrative offices and kitchens are on the first floor of the central (tower) section, of which the four succeeding floors above are occupied by wards and quarters for 51 internes, while the sixth floor is devoted to operative surgery and the seventh to physiotherapy. The east wing contains the out-patient departments (first and second floors), class rooms and laboratories (third and fourth floors); the west wing the isolation wards (first floor), private rooms (second and third floors) and the obstetric wards (fourth floor). The type of furniture in the individual rooms for patients and the well-arranged diet kitchen suggest an intelligent assimilation to the appointments and management of a Western hotel at moderate rates. Large groups of students were seen at work in the spacious dissection room and the physiological laboratory, while the unique and characteristic feature of clinical teaching in these newer Western centers—great numbers of students learning the art, the ethics and the etiquette of practice of medicine in innumerable little rooms—was everywhere apparent. The dean, Dr. Henry S. Houghton, acquired unique administrative experience as dean of the Harvard Medical School, Shanghai (1911-17) and as director of Peking Union Medical College (1918-27). A residence of over twenty years in Cathay has given him an unrivalled knowledge of the history and present condition of Chinese medicine.

ANN ARBOR

Ann Arbor, settled in 1824, incorporated in 1833 and chartered in 1851, was named after Mrs. Ann Allen and Mrs. Ann Rumsey, the wives of its founders. It early became the seat of the University of Michigan (1837). It

lies on the Huron River, only 38 miles from Detroit, commanding a view of the farms and orchards of the river valley from the residential districts. The Medical School of the University was organized in 1850 and has been co-educational from the start. It absorbed the Homeopathic Medical School in 1922 and separate homeopathic wards for male and female patients are maintained in the South Department of the University Hospital. Among its acquisitions are a number of bequests and memorial funds, the Palmer Memorial Ward for Sick Children, the Ford and Sager Anatomical Museums, the Pasteur Institute (1903), the Thomas Henry Simpson Memorial Institute for Medical Research (1924), intended primarily for investigation of pernicious anaemia, and a lectureship in surgery, founded in the same year (1924) by Dr. William J. Mayo. A University Hospital School for Nurses was established in 1891 and special courses in public health nursing are given. The University Hospital was designed primarily for the instruction of students. Clinical instruction in psychiatry is afforded at the State Psychopathic Hospital. The earlier history of the school is largely associated with the name of Dr. Victor C. Vaughan, who began to teach in the chemical laboratories in 1875 and was dean for three decades (1891-1921). The present dean is Dr. Hugh Cabot. The medical units are all of recent large scale type. Through full-time chairs in all the major subjects, a statewide consultation, clinical, laboratory and public health service, gratuitous to all who cannot afford to pay, is centered in the University. Our immediate destination was the Medical Library, which is housed in the University Library as an individual unit of a chain of ten special libraries, under the general control of the librarian, William Warner Bishop. This is the most important and best administered library system in the West, and the particular arrangement whereby the Medical Library can also utilize the resources of the University Library adjoining, and *vice versa*, seems highly advantageous.

ENVOY

The medical centers of the settled West are very delightful places to visit and the Westerner, on his own ground, displays an open heartiness of manner and a considerate spirit which, by contrast with the restrictive totems and taboos of the overcrowded East, is singularly vivifying and leaves the impression that a man is, for the first time, permitted, nay expected, to be himself. Recent developments in medical education in the centers visited seem exceedingly sensible in the uniform tendency toward State centralization by fusion with or absorption of lesser schools, since aspiration and effort may be thus more effectively concentrated and funds, bequests and endowments seem more readily obtainable. To this is probably due the rapid development of such picturesque and attractive medical centers as Ann Arbor, Madison, Rochester and Iowa City, which have already acquired something of the charm of the English and continental university towns. Where two or more important (not necessarily rival) schools compete side by side in a large city as in Chicago, Washington or San Francisco, such maximum unification of effort and financing is plainly unthinkable. The extreme limit of the trend against decentralization is attained in the type of medical school housed in a single large building, such as that of Northwestern University (Chicago) or the new medical units of the Mayo Foundation, Madison and Iowa City. With regard to the rigors of Western winters, the practical continuity of the medical school unit and the University hospital, as at Madison, by means of a closed passage-way between the two closely adjoining buildings, affords an additional advantage. A salient feature of Western medical teaching is the extraordinary number of undergraduate and post-graduate students engaged in the actual practice of medicine in the innumerable rooms devoted to the basic disciplines and specialties, or in smaller rooms set apart for the examination of individual patients.

as in the new clinical unit of the Mayo Foundation. The immense scale of these developments is impressive and in keeping with the enterprising character of the people and the physical resources of the Western country, where, as Jack London observed, there is still plenty of room to turn around in and where usually "the job seeks the man."

F. H. GARRISON.

CONTROL OF CONCEPTION, PRESENT AND FUTURE

ROBERT L. DICKINSON

Secretary, Committee on Maternal Health

Delivered February 15, 1929, in the Friday afternoon lecture series of The New York Academy of Medicine

My text is a quotation from a student of population who once ran the largest of the world's pediatric clinics, and who is soon to become President of the United States. As part of the "Child's Bill of Rights," he specifies that "There should be no child in America," first, "that has not the complete birthright of a sound mind in a sound body," and second, "that has not been born under proper conditions."

Toward carrying forward such a program, our business of the afternoon is the consideration of medical problems in the technique of human reproduction—the needs, efficacy and after-effects of birth control methods.

SIZE OF THE BIRTH CONTROL PROBLEM

Any health question calls for presentation under conspicuous medical auspices when it involves frequent decisions by a considerable part of the population and when it influences the well-being of the body, the peace of mind, and the future physique of the race. How large a proportion of our adults are affected? Nearly one-fourth. How frequently must a decision be made to procreate or not to procreate? About twice a week (3). There were in the United States in 1925 some ten million couples with both partners fertile, the wife neither pregnant nor nursing, who constituted 62 per cent of all the married couples. These twenty million persons represent one to every 4.3 individuals over 21 years of age (5). As to frequency, nearly two thousand case reports show coitus to be even oftener than twice a week among agriculturists (8) and the city poor (2).

NEW URGENCY OF THE PROBLEM

Of old, famine, pestilence and war, bad hygiene, and reckless feeding of infants wiped out surplus population. We are interfering with these grim regulators, and doctors must face the results of interference with smallpox and plague and sepsis and their allies. China and India complain that we have made their starvation problem worse. England has a million unemployed, and industrialism can no longer take up the excess. Japan and Italy breed a half million surplus babies each year, yet have not the iron and coal that altered Malthus' predictions. The earliest device, infanticide, is no longer a way out. Abortion we protest against. We do not agree with Luther who, when told that incessant breeding killed women, retorted: "Let them die; that is what they are for." The Germany of twenty years ago could breed deliberately for conquest, but when Mussolini teaches the same doctrine to-day, the nations look askance. As to situations in New York, I shall defer these to the end of the hour.

THE CONSTRUCTIVE WORK OF BIRTH CONTROL

While striving to limit the propagation of mental defectives and others grossly unfit, and guarding mothers from dangerous or excessive childbearing, we physicians would be grievously remiss if we failed to follow the recommendation of the most impressive of the birth control conferences, the one held in New York in 1925 (9), that "persons whose progeny gives promise of being of decided value to the community should be encouraged to bear as large families as they feasibly can." We will protest against extravagance and selfishness that refuse childbearing. We will urge decent salaries for missionaries, ministers and teachers, since it is their children that take the lead in *Who's Who*. We will collaborate with church and school and college and the American Social Hygiene Association in exalting marriage and monogamy and in honoring honorable acts of love. We will seek opportunities to do our part, as medical societies and as practitioners

and specialists, in sex education of the young. In other words, instead of *sidestepping*, we will share and lead. Then some day one of the halls in the Academy of Medicine or in the American Medical Association, crowded with a worthy audience, will be the Section on Sexology. I cannot tell you whether this will be in 1950 or 1940. I *can* tell you that with simplicity and dignity of attitude in such discourses the smirk and the dishonor go, and that underground curiosity will go. We whose hypocrisy and silence have fostered them will no longer play into the Devil's hands.

Action by the Profession. What action on this health question has the profession taken? It is only a hundred years since France began to restrict her birthrate, and a little more since Francis Place distributed tracts in England. It is eighty-five years since Dr. Knowlton's practical treatise was written in America, which was the cause of awakening England fifty years ago; and seventy-five years since Dr. Drysdale printed in London the first well-rounded presentation of the subject. Fifty years ago Holland started contraception. It is forty-eight years since, in our own state, the doctor who desired to postpone pregnancy to save lives obtained a statutory right to do so. But this right had to be confirmed for him in a court decision after the prison term of a certain dignified, auburn-haired nurse, and her name was Margaret Sanger.

Is this hundred years, or even fifty years, too soon to expect some organized medical society or public health body to investigate this problem?

Up to date, medical official action has taken this form: The New York Obstetrical Society's questionnaire gave a vote for investigation of birth control in 1923. The New York Academy of Medicine approved a program of study in 1924. The American Gynecological Society in 1924 voted for coöperation in the study and in 1925 recommended changes in the law that would allow medical books and scientific journals containing birth control technique to be mailed (Details are given in Appendix I).

The Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association in 1925 passed a resolution recommending changes in the law wherever necessary to allow control of conception by the physician. This was revived two years later, but was pigeon-holed, although in Pennsylvania, Connecticut and eight other states the law expressly forbids physicians to give contraceptive advice. One doctor in every eight in the country has written to the American Birth Control League for information; nearly two hundred county medical societies, covering every state, have asked for talks on birth control by their medical director, and the attendance, like this one, breaks the record. Nine leading hospitals in Greater New York formally include birth-control advice in their out-patient service, and out-patient clinics for birth control are in eight other places.

After the refusal of several medical bodies and public welfare organizations to study contraception, a self-constituted body, the Committee on Maternal Health, was organized under full medical control six years ago. I am its Secretary, a volunteer worker on a nine-hour day, with four secretaries. The Committee has three rooms in the Academy, but has no organic relation to it. One of our first acts was a report on the medical situation, including the technique of contraception (4). I mailed 1,500 reprints on the day that the journal which contained this article was posted, and another 1,500 have been mailed since. The Federal Law fathered by Comstock had, since 1873, forbidden medical knowledge of this kind to be sent by post even to doctors. Mine was the first extensive test of the attitude of the Post Office. Since then, Dr. Hannah Stone's able report on 1,465 well followed-up cases from the American Birth Control League (10) has been published in a medical journal and mailed as reprints, and Dr. James M. Cooper's large book, "The Technique of Contraception," (2) has gone out to 10,000 doctors. Vaginal diaphragms are expressed without hindrance. We may, therefore, infer that public opinion is such that interference with the necessary dissemination of medical knowledge or

supplies will not be countenanced. Just the same, in mailing the reprints I was guilty of 3,000 acts illegal and obscene. I object to fines footing up to fifteen millions and to being accused of being obscene so often. At any rate, medical writings on contraception are, according to the above experience, likely to be exempt from interference. I will return to the legal tangle later.

DANGERS AND OBJECTIONS

Free access to information and contraceptive materials will, it is said, foster widespread promiscuity in the unmarried and the married; favor gross sensuality in the latter, and even safeguard sexual intercourse as a mere love relation between husband and wife. Contraceptive practices will induce local inflammations—some say deadly ones; result in sterility if resorted to early in marriage, and increase childless marriages. Furthermore, there is the fear that such knowledge will be only put into practice by the intelligent, and thus this class will become overwhelmed by the progeny of the reckless and incompetent. Finally, the nation will stand naked to its enemies.

Promiscuity: A sure contraceptive obtainable anywhere would indeed remove risk or fear of pregnancy, and might be effective against venereal disease. Inasmuch as discovery of such a means is to be expected, and as present methods are reasonably secure and in part available, and as knowledge cannot be kept from men and women, restraint of coitus, if restraint is to become general, will have to lean upon a rigidly adverse public opinion, generally adopted; upon training in strength of character and perfection of self-control; upon religious and ethical ideals, and upon a single standard of continence and fidelity for men and women alike. One kind of opposition can do only harm, because vilifying or demeaning physical expressions of married love is seen to be false, and such teaching is one of the ways whereby the church has lost its hold on some human beings of fine type. One cannot fail to note how sexual restraint has developed at an amazing

rate from century to century. He who despairs of progress in this matter has never read history.

Physical Injury: There is no method of control of conception that has not been accused of causing bodily and mental damage. Abstinence has been condemned as freely as have mechanical devices (though not always by the same objectors). Well considered evidence is not extant in the way of large series of fairly complete histories followed up for long years, with observation of details of sex practices. There are however numerous published records of various local and nervous disabilities which ceased as soon as the use of the condom or withdrawal or some other contraceptive ceased. There is too much of this evidence to be disregarded. The weakness of it is that other possible factors are not excluded. Moreover, the cases in any series are few, and some of these are reported by statements so sweeping and with such evident bias as to lessen the weight of the evidence. Our Committee is collecting records on more generally accepted lines.

We have nearly twenty examples of injury from the intrauterine stem: one death, two removals of the pelvic organs for disability and inflammation, and the rest infections. There were also several pregnancies despite its use. Even the doctor who showed me over 1000 card records of use of the stem said it could only be counted on when removed every six or eight weeks, leaving the gutters cut by the wires to heal, and then replacing. The German aluminum intrauterine rod with its mushroom cap outside the cervix, or the looped silkworm strands of Pust above the extra-cervical glass button, have a convincing record of trouble as great as the Y-shaped wire wishbone mentioned above. The *original* method of Mensinga (1886) was to leave his soft rubber vaginal dome in place a month at a time, which bred irritations and inflammations, but such retention has long since been condemned and abandoned. The condom has been accused of producing nervous disturbances and prostatic enlargements.

Defrauding, originated by Onan of Old Testament fame, is charged with grievous penalties. *Coitus interruptus* and *reservatus* have carried a great share of the obloquy directed against contraception. Yet this is the only contraceptive method which has had prolonged clinical follow-up. A community which grew to number 300 people, strongly religious and therefore presumably emotional and intense, practiced withdrawal without emission for thirty years as a religious rite, with a frequency and duration of indulgence unparalleled elsewhere, according to available records. Yet physical examination near the end of the experiment showed singularly little nervous or other disturbance; an outstanding professor of gynecology reported favorably on the women; and as for the children they bred from carefully selected parents, there is no such average for general physical well-being and mental activity known to the Metropolitan Life Insurance Company. The Oneida Community in 1876 swung around to rigid monogamy. I can testify to their present culture and ideals as resembling those of the best Quaker and New England townships.

Contraceptive Advice Will Make Women Shirk Motherhood: On the average, applicants are treated in birth control clinics after four pregnancies and with three living children; nearly half have four or more living. Few young married women apply. Reports from various clinics run curiously alike in these figures, whether for America, where there are twenty-eight clinics, or for England with an equal number, for Germany with its hundred marriage advice stations, for Sweden, or for Russia. If this be shirking, give us more of it!

Contraception Produces Sterility: When young people marry before they can afford children, and the wife works and saves till they can, it is alleged that prevention will have produced barrenness when they do desire a baby. So says one British National Birthrate Commission report (7). When I read the galley, I challenged the two writers

of such statements to produce case records of young people examined at marriage and found presumably fertile, who were later examined and found sterile (6). They could give no instances. For years our Committee has searched for such cases and found none save where the intrauterine stem had been used. Of impressions and beliefs there are several, but good evidence—not yet. This is a serious matter, for gynecologists of note have given warnings that no couple should marry until ready to procreate. Such advice fosters late marriage and extension of engagements over years, whereby the dangers of illicit intercourse are increased.

“NATURAL” AND “UNNATURAL” METHODS OF CONTROL

You will be frequently asked by conscientious and puzzled people what the distinction is. An able writer like Dr. Arthur Giles is so sure that he knows, that he uses words like “natural” and “insult to Nature” eleven times in two pages, opening his chapter with these dreadful threats: “Nature never forgives,” and “Control is a violation of the law of Nature.” (7)

One resounding pronouncement is that of the Anglican Bishops at Lambeth. They sanctioned “natural” modes of control, but condemned all mechanical devices and chemical means. And yet the Right Reverend gentlemen may have been at variance with nature that very day: They had slept in beds, not on the ground; they had bathed in tubs, not brooks; they had scraped their chins with knives, had cleaned artificial teeth; had dressed in clothes, donned spectacles, eaten cooked food (and not with their fingers), and then been driven to the palace across a bridge and sat in chairs in a warmed room behind glass under a roof! There, they proceeded to pronounce mechanical devices as against Nature’s laws! To be consistent, they should, after a meal of raw turnips, have swum the Thames to the meeting, and sat about a tree in conclave on the grass, robed in the dignity of Nature’s tan!

Though an Episcopalian and a lover of nature, my forty years as father confessor to human beings who love in fine honor force me to differ from Lambeth. Abstinence is found to be no answer, and the bishops' safe period no solution. Perhaps the patients of bishops all have opposite wings of palaces to retire to at night. Mine sleep in the same bed.

NOTE.—Dr. Dickinson here lectured on technique, taking up methods and indications and adaptations, and offered to hold a round table at regular intervals if the demand was sufficient.—Editor.

URGENCY OF THE PROBLEM IN NEW YORK

"Does not everybody know?" asks Dr. Simon Flexner. "Does not any drugstore sell the wherewithal?" In answer let us give, not the sob-story of the propagandist, but fair examples from notable services in the city:

A woman in convulsions enters Bellevue, the State's largest hospital, or the Lying-In, the country's largest maternity service. The baby arrives dead; the mother is barely saved. On discharge, the doctor warns the patient not to become pregnant again till her bad kidneys are well. No, he cannot tell her how to protect herself. Where is the advice to be had? He declines to inform her. True, if she becomes pregnant again, she can come back, and if it is needed to save her life or her eyesight, an operative abortion will be done. Indeed, she can be aborted every four or six months if her kidneys go on strike each time. But she may not be told in either of these two great institutions how to avoid the jeopardy until well enough to carry on with a pregnancy.

Though the law sanctions advice to prevent breakdowns, to have had twelve children is not reason enough for giving birth control advice in our newest and tallest clinic. Our woman with kidneys on strike is discovered by a social worker, who sees her through a third therapeutic abortion, and after the third medical warning with treatment refused, takes her to a hospital clinic or separate birth control clinic that *will* give her contraceptive advice.

(She happens to be a Protestant). Note what happens next. Soon the head of the great charity in whose service the worker performed this act of ordinary humanity is officially notified that if word comes again that any worker refers any patient for birth control advice, all contributions from members of a particular denomination will be stopped. This is general experience.

A feeble-minded woman, with children already in the institution, enters Letchworth Village pregnant. The new baby joins the other children in the institution for life. If, after a few years' training, this inmate is qualified to support herself, or her husband will support her, the superintendent has no sanction to sterilize her before release, however urgently she or her family may ask it. We have not the sterilization law that nineteen other states enjoy, to back the doctors of asylums—and the doctors dare not give her contraceptive advice!

We can multiply case records of this kind from our files.

The need of contraception is the greater in our city in that one-sixth of the population is instructed by its priests that if this mother whom we have used as an example has uremic convulsions early in pregnancy, she must not be saved by emptying the uterus. This would be deliberate murder, because the two souls—that of the mother of four and that of the second-month embryo—are equal before God. The more need of contraception in this denomination!

THE NEW PREVENTIVE MEDICINE

The question involves *every* mother after delivery, who requires instruction in measures to take to avoid pregnancy until she is fit to bear another child; it includes every convalescent from operation or real illness and every woman worn down by imperative overwork. And the doctor who does not help to prevent the start of a pregnancy that he is persuaded will run his patient down further—

how does he excuse himself for a neglect of ordinary health protection? Shall his patient, mother of two or three, without means, and married to a chronic alcoholic, go on bearing? Or this worn-out wife of a hopeless incompetent, just because she has not *yet* gotten tuberculosis, or because her strained heart muscle still compensates?

We doctors are afraid of the words "social and economic grounds" for birth control advice. But the father getting mean wages or long out of work or ill, the underpaid teacher with children, the young couple who would marry if the wife could go on working and postpone child-bearing a year or two, the couple with all the children they can decently rear—are we to sidestep these problems?

THE ORGANIZED OPPOSITION

It is generally supposed that one of the greatest of the Churches is completely, consistently and unalterably opposed to birth control. This is only partly true. This Church makes exceptions. It sanctions birth control of three sorts under certain conditions: one method is by abstinence, one is the "safe period," and one is *coitus reservatus*. As long ago as 1842 the proper authority directed that a woman committed no sin whose husband insisted on withdrawal, and quoted Liguori that the confessor is not usually called upon to make inquiry upon so delicate a matter as the conjugal debt, and if his opinion is not asked, he should be silent. Among its greatest leaders in social work, there is evidence of strong feeling that the confessor should have a chance to absolve a woman under certain conditions—as with the worn out mother of thirty with five children, or our patient with Bright's disease. Not to do so "keeps people from the confessional."

This wise Church can be expected to increase the number of its exceptions. Said a prominent writer and speaker of this faith: "We are fighting a losing fight." But the fight is well organized and carried on all fronts.

MEDICAL OPINION AND ACTION CHANGING

The last three years have seen great alterations. In Philadelphia, leaders like George de Schweinitz, Alfred Stengel, B. C. Hirst, Floyd Keene, Anspach and Vaux are members of the council of the Pennsylvania Birth Control Federation. The Los Angeles County Health Department under Dr. Pomeroy runs birth control clinics as part of its child hygiene service. So does the state-supported Colorado General Hospital. There are twenty-eight birth control clinics in the United States. Out-patient departments in nine of the chief hospitals of New York City give this service, as in Sloane, the Woman's, and Mt. Sinai.

Even so, the need in New York City is such that, after investigation, The New York Academy of Medicine in 1926 endorsed a plan for a special demonstration clinic under responsible and representative medical control and state license. Such a clinic is needed to test technique, to follow up patients, to study adaptation of a variety of methods to individual needs, and also to determine the medical indications for contraception and therapeutic abortion and for sterilization. Heretofore, the hospital staffs have shown a languid interest in protecting their patients. Here is an example:

In the largest hospital of its kind in this country, where the staff has known for four years that birth control treatment is skillfully given in the gynecological out-patient service, in some months there are as many as four cases referred for abortion, these abortions to be done for grave disease on patients who have been, mark you, many months in the care of the doctor referring. Prevention of abortion is a neglected branch of preventive medicine.

To meet the recommendation of the Academy for a special study, nine national figures in medicine have stood ready to incorporate and undertake responsibility for a demonstration clinic on the lines of these specifications. Mrs. Sanger has offered her Bureau for Clinical Research, an active clinic with fifteen sessions weekly, and 1500 new

cases a year, to be taken over for responsible medical control under the Academy plan.

In 1923 application was made to the State Board of Charities for a license (1). The three standard requirements for license—to show the need, to have sufficient funds, and acceptable incorporators—were met, as the Board acknowledged; but it thereupon developed an extraordinary, novel requirement; to wit, that before this scientific investigation under the highest auspices could proceed, the chief Church organizations must waive objections. Waivers were available from the Jewish and Episcopal Churches and the Federal Council of Protestant sects; only one Church ignored all communications. The plan of the Academy, the fact that professors from Bellevue, Long Island, Harvard, Johns Hopkins and the University of Illinois and others well known would be in control availed nothing. A scientific investigation having the highest professional endorsement must await ecclesiastical sanction. Finally, after many months of effort the Board, in the fall of 1926, declined to grant the license on the ground that it was against public policy to license further specialty clinics in New York City. Consequently the only extensive clinical study of birth control in existence, equipped with proper histories and follow-up, must continue to function behind the sign of a private practitioner and is still denied the character of medical supervision and the kind of recognition, inspection and affiliation it might otherwise secure.

THE LEGAL TANGLE

The doctor asks nothing but freedom—clearly worded freedom—to do for his patients what he wants done for his own wife and daughters.

But has he this freedom? Let us see.

National Laws: Taking first the United States as a whole, no doctor can without breaking the law use the United States mails or any common carrier to *receive* or

to send information or material having to do with the control of conception directly or indirectly. In 1873 the control of conception was legally described as *obscene, lewd, lascivious, filthy and indecent*, and therefore to aid and abet it was a criminal offense. There are five articles in the Federal criminal code covering this: 102, 211, 245, 305 and 312. These laws include scientific books, pamphlets, journals, and illustrations, as well as mechanical devices, drugs or prescriptions. They are sweeping and explicit and apply to everybody alike with no exceptions or qualifications. Successive serious attempts have found no loopholes for other interpretation and all efforts to secure amendments have failed.*

Restrictive State Laws: But, even if knowledge or the wherewithal for controlling conception is not transmissible by post or other carrier, surely the doctor in any given locality can practice preventive medicine in this field, with indigenous information and home grown material?

In fifteen states he cannot do so freely, because of restrictive state laws, and in six others he can only by exception. This leaves twenty-eight states where, more or less unimpeded, he can give such advice as he can develop for himself or learn by word of mouth, and treat with such means as he can make or secure without help from the post office or other common carrier.

* That information and material are sent without molestation by doctor to doctor, or by doctor to patient, is beside the point. The practice is bootlegging and is carried on by sufferance, as no government agent has been willing to give any doctor a written assurance of non-interference. The Income Tax Bureau has just declared that a certain large contributor to the birth control movement must pay a tax on portions of his income for which he claimed exemption, because the donations were made to an organization that broke the law. The particular instance cited was the referring of a patient, appealing by letter for birth control information, to the Bureau of Contraceptive Advice, run by Johns Hopkins physicians in Baltimore. No instruction was given; the woman was merely directed to a clinic conducted openly, but the law may be construed to include this direction as information "calculated to lead another to use or apply it for preventing conception."

The state restrictions vary but most of them are patterned on the United States laws and were passed in the decade following the Comstock laws (1873).

In ten states no one may give contraceptive advice or material, or seek it, or tell anyone where it may be obtained. Physicians are not exempt, either by statute or interpretation in Pennsylvania, the District of Columbia, Missouri, Nebraska, Kansas, Mississippi, Montana, Arizona, Idaho and Washington.

To be sure, medical colleges and books are exempt in Nebraska, Missouri and Pennsylvania; and medical books in Kansas. But whatever a doctor learns by these means must be kept to himself if the law is to be obeyed.

In our neighboring state, Connecticut, no one may "use any drug, medical article or instrument for the purpose of preventing conception." This is the only state where the *practice* is forbidden, and where the title of the law specifies its purpose. This unenforced and unenforceable law has recently been upheld by the State Assembly when confronted with a bill calling for its removal.

Five other states, Maine, New Hampshire, Massachusetts, New Jersey and California, have general obscenity laws against advertisement or sale or possession of contraceptive information or material, which by implication may hamper clinical practice, because the medical profession is not specifically exempt, and the law has not been *formally* interpreted. The New Jersey law has a provisory clause to the effect that contraceptive information and material may not be transmitted without "just cause." A clinic has been started in Newark with a notable group of physicians on its medical board. In California there are several clinics, one under Government auspices, and in Massachusetts a birth control league with leading medical names has been started.

State Laws Exempting Medicine: In the states where the medical man is exempt from the legal penalties laid on the commoner, this is how the line is drawn:

Physicians, medical books, medical colleges and druggists are exempt in Ohio, Indiana, Colorado and Wyoming, and *physicians* alone in Nevada and New York. (In Colorado no "knowledge" of contraception can be brought into the state!)

This brings us to our own state of New York where the doctor is in a unique position. By a recent statute (1926) he risks losing his license if he gives contraceptive advice even for grave disease. By an earlier law (1881) he is permitted to give this advice. To the illegal mind it sounds like this: "You may, but you must not."

The Medical Practice Act of 1926 provides (174, e) that the license of a practitioner may be revoked "... if he undertakes in any manner . . . or by any means . . . to violate *Section 1142*" of the State Penal Law. *Section 1142*, passed in 1873, deals with "indecent articles" and provides among other things that *any* person is guilty of a misdemeanor who furnishes or has in his possession any article or recipe for the prevention of conception, or leads another to use it, or gives information where such can be obtained. No exception for physicians is mentioned in this *Section* nor in the Medical Practice Act. But, as an afterthought, in a *section* (1145) further on, hidden in verbiage, with careful avoidance of the crucial words, as it were, by inference, doctor and patient are declared *not* guilty when acting to cure or prevent disease (*Section 1145* was passed in 1881).

By the addition of a few words the ambiguity and obscurity could be done away with. In the 1929 bill (Assembly Introductory No. 35) it was proposed to amend *Section 1145* so that "contraceptive treatment" should no longer be hidden or left to inference, but directly indicated and in addition be mentioned as "for married persons." (See appended text of New York State laws and the proposed amendment). This bill like several predecessors was not voted out of the Codes Committee.

It is suggested that another year the amending bill be directed to Section 1142 as well as, or instead of, 1145. The simplest way of getting order would be to take control of conception out of the category of "indecent articles." But if restrictive legislation is deemed desirable, then 1142 should carry an exempting clause, either excepting physicians, or calling attention to 1145. Also the amendment to 1145 should read "contraceptive *advice*" rather than treatment, as this implies a therapeutic usage, whereas economic and social reasons should be admissible in a reasonable program of preventive medicine.

SUMMARY AND CONCLUSION

Histories which disprove many of the common accusations against birth control are in our hands. These seem to show that:

- 1) *The usual methods are harmless.* It is the little used intrauterine stem and an abandoned German practice that have done the damage.
- 2) *Production of sterility is not proved.* Evidence is lacking, in our six-year hunt for case records, of sterility from methods other than the intrauterine stem.
- 3) *The methods are reasonably effective.* Clinically approved methods show ninety-five per cent protection, which compares well with medical treatment of other sorts.
- 4) *Women do not shirk motherhood.* They come to clinics usually after four pregnancies, with three living children; nearly half have four or more living. This applies to England, Germany, Sweden and Russia, as well as to America.

Three of the great strides of medicine are toward :

Control of pain in labor and operation
Control of infection in obstetrics and surgery
Control of communicable disease

These three advances made in the face of opposition and indifference on the part of the organized profession, are now its common pride and glory.

A fourth control, control of conception, needed to safeguard life and health and happiness, though now suspect and maligned, will take its place of honor with these others. Courage and wisdom were required to restrain the forces of disease and death. A greater courage and a higher wisdom are called for within our profession to undertake a guiding part in the control of life.

Appendix

I STATEMENTS AND RESOLUTIONS BY MEDICAL SOCIETIES

A. The New York Academy of Medicine, via its Public Health Committee (now the Committee on Public Health Relations), in its 1920 report (p. 5) discussing current bills amending the national laws on birth control, suggested

"such change in the existing law as would make the existing inhibitions inapplicable to duly licensed physicians, to licensed dispensaries and to the public health authorities in connection with the discharge of their respective duties in protecting the health of their patients or of the community."

Again, in 1921 (Annual Report p. 17), speaking of state legislation, the Committee expressed itself in favor "of amending the law so as to confirm by legislative action the opinion expressed by Justice Kelby of the New York State Supreme Court, that the existing law permits physicians to furnish contraceptive information to their patients when such information is essential for the preservation of the patient's health."

In its 1925 Annual Report the Committee spoke of the need for a demonstration birth control clinic as follows:

"The Committee on Maternal Health brought to the attention of the Public Health Committee the fact that little research in the problems of sterility and contraception is being done in the out-patient clinics of hospitals and also that such research is desirable from the point of view of proper medical advice and the health and welfare of women suffering from

organic diseases of the lungs, heart or kidneys. A special sub-committee was appointed to investigate the matter, consisting of Drs. Dickinson, Bailey and Kosmak, and on their recommendation the following resolution was adopted by the Public Health Committee:

"In view of the fact

1. That many existing hospital clinics in the City of New York are reluctant to carry on a study of contraceptive technique, and those which have entered upon it are not generally known to have undertaken it;

2. That there is a provisional need of a special clinic; and

3. That although lawfully practicing physicians are permitted under the statute to give contraceptive advice 'for the cure and prevention of disease', they do not usually take advantage of this provision of the law (Section 1145 of the Penal Law),

"Therefore, it is the opinion of the Committee that there is for the time being a need in New York City for a clinic under non-hospital auspices for the purposes described above. For its operation this special clinic should obtain legal sanction from the State Board of Charities, and should provide an adequate personnel and equipment for diagnosis and research and an advisory board of gynecologists and obstetricians of recognized authority to guide its policies and work, and inspect it regularly."

B. *American Gynecological Society*, 1925. Because the Postal Law forbids the transmission of practical information and even medical publications concerning birth control, the following suggested amendment was submitted to and endorsed by the Society in 1925:

"Standard medical and scientific journals and reprints therefrom and standard medical works which contain information with reference to the prevention of conception are *not* non-mailable under this section."

This amendment would apply to Section 211 of the Criminal Code of the U. S. Similar amendments would be necessary to Section 245 relating to transmission by other public or common carriers, to Section 312, relating to sales and advertisements, and to Section 305 of the Tariff Act, governing importations.

C. *The American Medical Association*, 1925. As both our Federal and State laws in differing degrees hamper physicians in giving contraceptive advice to their patients, the following resolution was submitted and passed by the Section on Obstetrics, Gynecology and Abdominal Surgery, in 1925:

"Resolved, that we hereby recommend the alteration of existing laws wherever necessary, so that physicians may legally give contraceptive information to their patients in the regular course of their practice."

This resolution was referred to the House of Delegates, who ignored it entirely in 1926 and in 1927 sent it to the Board of Trustees (J. A. M. A. June 14, 1927, p. 1813).

In 1928, the Board of Trustees in their report on resolutions disposed of this particular one with these words:

"In view of the great lack of unanimity of opinion with respect to the subject matter covered by the resolution, the Board of Trustees respectfully refers the matter back to the House of Delegates."

So far as we have been able to ascertain, no action was taken by the House of Delegates at the Minneapolis meeting.

II NEW YORK STATE LAWS APPLYING TO CONTRACEPTION

1. *Extract from the Medical Practice Act (of 1926)* "174 Revocation of Certificates; Annulment of Registration and Discipline" . . .

2. "the license of a practitioner of medicine may be revoked, suspended or annulled or such practitioner reprimanded or disciplined in accordance with the provisions and procedure of this act in any of the following cases:" . . .

"(e) That a physician did undertake or engage in any manner or by any ways or means whatsoever to procure or to perform any criminal abortion and/or to violate section eleven hundred and forty-two of the penal law."

2. *New York State Penal Law*

a) "Section 1142 (1873). *Indecent articles.*"

"A person who sells, lends, gives away, or in any manner exhibits or offers to sell, lend or give away, or has in his possession with intent to sell, lend or give away, or advertises, or offers for sale, loan or distribution, any instrument or article, or any recipe, drug or medicine for the prevention of conception, or for causing unlawful abortion, or purporting to be for the prevention of conception, or for causing unlawful abortion, or advertises, or holds out representations that it can be so used or applied, or any such description as will be calculated to lead another to so use or apply any such article, recipe, drug, medicine, or instrument, or who writes

or prints, or causes to be written or printed, a card, circular, pamphlet, advertisement or notice of any kind, or gives information orally, stating when, where, how, of whom, or by what means such an instrument, article, recipe, drug or medicine can be purchased or obtained, or who manufactures any such instrument, article, recipe, drug or medicine, is guilty of a misdemeanor, and shall be liable to the same penalties as provided in section eleven hundred and forty-one of this chapter."

b) "*Section 1145 (1881) 'Physicians' instruments.'* (The so-called 'physicians' exemption')". "An article or instrument, used or applied by physicians lawfully practicing, or by their direction or prescription, for the cure or prevention of disease, is not an article of indecent or immoral nature or use, within this article. The supplying of such articles to such physicians or by their direction or prescription, is not an offense under this article."

3. *Proposed Amendment to Penal Law, Section 1145 (Introductory Bill No. 35, 1929).*

"An Act To amend the penal law, in relation to physicians' instruments." . . .

Section 1. Section eleven hundred and forty-five of the penal law is hereby amended to read as follows:

No. 1145. *Physicians' instruments.* An article or instrument, used or applied by physicians lawfully practicing, or by their direction or prescription, *for the contraceptive treatment of married persons or* for the cure or prevention of disease, is not an article of indecent or immoral nature or use, within this article. The supplying of such articles to such physicians or by their direction or prescription is not an offense under this article.

No. 2. This act shall take effect immediately.

(Matter in italics new)

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PRELIMINARY REPORT OF ORAL B C G VACCINATION IN NEW YORK CITY, ON HUMAN BEINGS

(ABSTRACT)

CAMILLE KERESZTURI

From the Research Laboratory of the Department of Health

We started the vaccination with Bacilli Calmette Guérin in New York City on December 15, 1926. The total number of vaccinated babies is 133. Thirty-three of them are over one year of age, the oldest one is twenty months of age.

The tuberculosis situation is different here from that in Europe, because (1) the foci of infection are not so widespread here, (2) the social conditions are better in America, (3) the general intelligence is higher in this country. Consequently, we could not expect the 25 per cent tuberculosis mortality of babies under one year of age, which Calmette finds for France, to be true for New York. We therefore had to make our own control statistics. Two hundred and eighty-two babies, belonging to tuberculous families, who received no vaccine were followed up by us from birth or from the early months of the first year of life. The average tuberculosis mortality among them is 8 per cent. This figure will undoubtedly change because only 66 per cent of them have finished their first year. In the vaccinated group the tuberculosis mortality is 1.6 per cent but only 40 per cent of them are over one year of age. The general mortality of our vaccinated group is less than among the controls, that is, 9.6 per cent instead of 18.8 per cent.¹

All of our vaccinated and control babies are from tuberculous families having a tubercular member at home with negative or positive sputum. But not all of them are actually exposed because in some of the cases the tubercular

* Delivered before the Section of Pediatrics, November 8, 1928. Aided by a grant of money from the Metropolitan Life Insurance Company.

¹ In the general mortality everything is included, tuberculosis mortality also.

member died and so did not come in contact with the baby. In others the tubercular member is still in the hospital. Only sixteen of our vaccinated babies are in close contact with open tuberculosis. In the control cases the exposure is somewhat greater, because we make up our control group of non-co-operative cases and occasionally of older infants which were already exposed, when we get them.

In making our statistics we are liable to make mistakes through faulty diagnosis, because it is very hard not to miss a tuberculosis case in such an early age, without autopsy. All our B C G babies died in hospitals and we obtained autopsies in 50 per cent of them, whereas in the control group not all of them died in hospitals and only 33 per cent of them were autopsied. Our vaccinated group therefore contains more exact figures than the control group. We are sure we did not miss a single tuberculosis death in the B C G babies.

We lost two B C G babies from tuberculosis. Both are problem cases for us. The mother of the first one died shortly after delivery of miliary tuberculosis herself: the baby was not exposed to tuberculosis at all. It is possible that the baby died of an intra-uterine infection. The second one was never separated from his positive-sputum, third-stage, tubercular father at all. As you know, Calmette urges one month of separation after the vaccine is given, this being the time believed to be necessary for the development of the immunity. We are not always able to carry out this rule because some parents consent to the vaccination while they refuse the separation.

We were able to observe a few interesting facts in our control group. Our observations are liable to change because only 66 per cent of our controls finished the first year. (1) Thirty-seven per cent of the total group reacted positively to tuberculin within the first year; (2) there was no special difference in the hypersensitiveness according to whether the mother or the father was tubercular; (3) in the negative Mantoux test group we hardly ever were able to observe parenchymal x-ray changes in the lungs.

Even in the positive Mantoux group in the infants doing well we noted more than hilus changes only once in a great while, while in the group who later on died of tuberculosis, we noted parenchymal lesions quite frequently. So parenchymatous lung changes at this early age have had a bad prognostic significance. In the vaccinated group the B C G vaccine itself without any exposure to tuberculosis frequently gives a temporary hypersensitiveness. The steady positive Mantoux tests are believed to be caused by infection due to exposure to tuberculosis. Twenty-four per cent of our B C G babies have had a positive tuberculin test within the first year.

We never observed parenchymal x-ray changes among our B C G babies except in the two who died of miliary tuberculosis later on. The regular change is the enlarged hilus shadow, but this is a very indefinite thing to judge among young infants.

We tried to get information from the differential blood count after vaccination, but we found that the physiological variations of the blood picture of the new-borns are so large that our conclusions are not very reliable.

Through the co-operation of Miss Mishulow, who examined the stools of some of our B C G vaccinated babies we found that the excretion of a great number of the B C G bacilli takes place between the eighth and the thirty-first hours after the administration of the vaccine.

For re-vaccination Calmette suggests the use of the oral method also. We re-vaccinated five babies who were over one year of age and were strongly exposed. We believe that the B C G work is promising. The tuberculosis mortality decreased from 8 per cent to 1.6 per cent. If this is due partly to the vaccine or is only coincidence we are unable to tell yet. The weak point of the whole vaccination is that, as Calmette does not believe that the hypersensitiveness and immunity run parallel with each other, we have no other means of controlling what we are doing than by our carefully observed mortality statistics.

ANSWER TO THE DISCUSSION OF DR. KERESZTURI'S LECTURE

DR. KERESZTURI: Almost all of our B C G vaccinated babies are frequently given the Mantoux test. Very few of them persistently give a positive tuberculin test. Those that do are, in the majority of cases, exposed to some form of tuberculosis. Those babies who are not exposed at all react either negatively, or they give one or two positive Mantoux tests, and then they lose their hypersensitiveness for tuberculin. The type of this changing tuberculin test is rather less circumscribed and less infiltrated than the permanent one. There is little chance that we made a mistake in reading these slightly positive, changing Mantoux tests, because in the doubtful cases more than one person was seeing the tests. In conclusion we might say, we think, that the changing Mantoux test is due to the vaccine itself, and the persistent one is due to infection with human bacilli.

Just a few days ago we received a similar report from Dr. Leon Bernard in Paris. He examined the hypersensitiveness of 120 B C G babies in frequent periods, without exposing them to tuberculosis. He was able to observe the same type of changing Mantoux tests among them as we did among our non-exposed B C G vaccinated babies.

The majority of the scientists and clinicians of this and of other countries are of the same opinion as Dr. Smith is, *i. e.*, they cannot imagine tuberculosis immunity without a positive tuberculin test. Calmette himself is convinced that hypersensitivity and immunity do not run parallel with each other.

Concerning the other objection of Dr. Charles Hendee Smith, that the vaccinated group is more intelligent and more coöperative than the control group and we are liable to pay more attention to the vaccinated group than we do to the control group, I want to mention the following: We are very careful to treat the two groups alike. Our aim is to improve the hygienic condition of all of our patients as much as possible. It is true that some of the parents give consent

to the vaccination, because they are intelligent and they want to do everything for the benefit of their children. On the other hand, we have a group of B C G families where they signed their consent because they are indolent and they do not care what will happen to their children anyhow. Probably we have somewhat more co-operative cases among the vaccinated group, but the difference is not great.

About the criticism of the x-ray picture, I agree with Dr. Smith. It is very hard to diagnose them in such an early age. The position of the child, the stage of expiration or inspiration which we are unable to control in so many cases are all disturbing factors. If there is an antagonism between the Mantoux test and the x-ray picture, we usually pay more attention to the tuberculin test.

Concerning the future of the problem, my feeling is that the subcutaneous method will be the final solution. But before we switch over to this, we want to be sure not only that it is better but also harmless. All the evidence suggests that the oral method is a less effective immunizing method, than the subcutaneous one.

THE CENTENARY OF JOHANN NEPOMUK
CZERMAK *

DAVID BRYSON DELAVAN

President, N. Y. Laryngological Society

At the November meeting of the New York Laryngological Society, the President called attention to the fact that the year 1928 marked the centenary of the birth of Professor Johann Czermak, the perfector of the technique of laryngoscopy and rhinoscopy, and proceeded to commemorate the event as follows:

The members of this Society and of the Academy of Medicine will recollect with pleasure the visit several years ago of Dr. Ferdinand Nager, Professor of Oto-laryngology in the University of Zurich. We can never forget the charming personality of the man nor the distinguished professional achievements which have placed him in the forefront of his contemporaries.

During the early part of the past summer a package was received from Professor Nager containing a complete and perfect edition of the works of Professor Czermak. Following this a letter arrived from him which after some friendly preliminaries read as follows: "By this mail I send you for your medical historical collection some pictures which I should like to present to you. They represent Czermak in his demonstration of laryngoscopy. You probably know that on June 17th, 1928, was his one hundredth birthday. His daughter reminded me of the date, so at our meeting of the Swiss Otological Society I offered some remarks about him. As you have the collection of all his papers, already sent to you, you will find in volume third his biography, by his friend the famous Anton Springer, who later on was a well known publisher in the history of art. Perhaps you will have occasion to remember Professor Czermak in your Laryngological Society, based on the details of this biography.

* Delivered before the New York Laryngological Society, November, 1928.

I believe it to be our duty to remember the work of our predecessors.

I hope to see you at the International Congress at Copenhagen, or at least to get some news of you from your American friends. With kindest regards, I remain,

Yours very sincerely,

F. R. NAGER."

Pursuant to the suggestion of Professor Nager, let me offer the following testimonial to the life and work of the man who, before all others of his time, was instrumental in the development of the laryngoscope.

Johann Nepomuk Czermak was born in Prag, Bohemia, June 17th, 1828, of excellent parentage. His grandfather had been a successful physician and his father was the leading practitioner in Prag, having among his clientele the families of the most aristocratic and influential people. The position attained by Johann Czermak himself as Professor of Physiology in the University of Leipsic, fully attests *his* prominence. He distinguished himself not only through his lectures, but through numerous published contributions of marked scientific value, covering a somewhat wide field. To us the most interesting are those which relate to the upper air passages in general and in particular to his recognition of the value of the idea of the laryngoscope and his zeal in developing its possibilities and in instructing the world at large in its practical application.

It was Czermak who, appreciating the neglected idea of Mr. Liston and of Manuel Garcia, adapted it to general usage by suggesting the cardinal principles of the technique of laryngoscopy and perfectly elaborating them, as the following recital will explain: Liston, Garcia, and even Turck whose claim of priority over Czermak provoked endless discussion, used sunlight as the illuminating power, their examinations being thus restricted to periods of clear weather, and, incidentally speaking, confined to experiments made upon specially trained, tolerant individuals.

Czermak first called attention to the disadvantages of depending upon sunlight and introduced the use of artificial light. Having demonstrated the advantages thus secured, he developed a second innovation—the concentration of the light by means of a concave mirror, the center of which was perforated to enable the transmission of the rays to the observer's eye. He also devised a contrivance by which the staff to which the mirror was attached was held between the observer's teeth. He soon abandoned this device substituting the spectacle frame, and later the head band, as suggested by his contemporary, Semeleder. He also improved the small dental mirror, especially advocating the use of highly polished steel. Combining these ideas he evolved the principles which with their numerous modifications are employed to-day, namely, the use of artificial light, the concave head mirror, and the improved small mirrors. The articles describing this development appeared in 1858, presenting a remarkable achievement for one barely thirty years of age. In the spring of '58, Czermak announced a new principle for the examination of the larynx—the method of transillumination, apparently his own original idea. This is set forth and illustrated in the article on the laryngoscope, published in his collected writings, Volume III, page 501. This same article is otherwise beautifully illustrated and gives clear, explicit and comprehensive explanations of his methods.

But Czermak did not stop at the development of laryngoscopy. It was he, again, who in 1858 first demonstrated the possibility of the examination of the upper pharynx, developed and demonstrated the method of accomplishing this, and so inaugurated rhinoscopy.

Already he had developed the art of auto-laryngoscopy. As early as 1861, he conceived and announced the idea of photographing the interior of the larynx, with the aid of the laryngoscope. In 1859 he began to publish original observations upon the physiology of the larynx and of speech, and in the same year contributed studies upon various pathological conditions of the larynx.

From the simple relation of these facts the genius of Czermak is evident. Whatever claims may have been made by his contemporaries, the contributions of none were equal either in number or in basic importance to his. We therefore are fully justified in according to him the first, the highest rank, and in paying tribute to him on this occasion.

Following this introduction four large and beautiful pictures were displayed, the gift of Professor Nager, representing a portrait of Czermak, his method of autolaryngoscopy, and his method of laryngoscopy, and a portrait of his friend and biographer, Anton Springer.

There was also presented, as illustrating the progress of the development of laryngology and rhinology, portraits of Dr. Philip Sing Physick, of Philadelphia, the inventor of the prototype of the modern tonsillotome, a description of which was published just one hundred years ago; of Horace Green, Father of Laryngology, and of Gurdon Buck, Father of Intralaryngeal Surgery, both of New York; of Manuel Garcia, Czermak, Semeleder; of Turck of Vienna, the great instructor, Czermak's rival in regard to priority, and of certain others who had notably advanced the specialty in this country, including portraits of pioneers such as Solis-Cohen, Bosworth, Roe, O'Dwyer, Lefferts, French, Bryan, John Mackenzie, Hooper and Ingals.

The three volume set of the biography and works of Czermak, the gift of Professor Nager, was displayed. Attention was called to the presence in the collection of Dr. Delavan of a fine bust of Czermak which he had obtained in Buda Pesth twenty years ago, and to a perfect and complete specimen of the original laryngoscopic apparatus of Czermak, originally secured by Tiemann and Company, and obtained directly from them.

ON MOTION a unanimous vote of thanks and appreciation was tendered to Professor Nager for the thoughtful and friendly interest manifested in his communication and gifts.

MODERN METHODS OF RESUSCITATION IN NEW YORK CITY *

DANIEL J. DONOVAN

Chief Surgeon, New York Police Department

It is about twelve years since I became interested in the subject before this meeting, and in the beginning I had very little encouragement and scarcely any up-to-the-minute literature to draw upon. It was my conviction, in view of the number of deaths, both accidental and suicidal, in New York City from drowning, electric shock and gas poisoning, that steps should be taken to equip the general public, as far as possible, with a knowledge of resuscitation methods. As a vital step in this direction, it appealed to me that the teaching of artificial respiration must be made an integral part of the training of future police officers in the training school at Police Headquarters, as aside from the direct effect of making these officers potential salvagers of human life, their demonstrations of the efficacy of this training when confronted with impending tragedy in the field of their daily duties, would serve as a prolific means of arousing the city-wide interest of the public. Accordingly, about eight years ago I caused to be inserted in the curriculum a course of training in the Shaeffer prone pressure method of artificial respiration.

The Police Department Training School for recruits has become an educational institute wherein men are subjected to a ninety day period of moral, mental and physical training and discipline, so that when they take up their duties as Probationary Patrolmen, the City of New York has added to its host of guardians a body of men possessing the advantages and qualifications that only the most intensive daily training under the most modern methods known can instill. During this course daily drill in prone pressure methods insures the students becoming particularly adept at applying this treatment. It has been my good

* Delivered before the Section of Medicine, February 19, 1929.

fortune to witness this forward, constructive progress, and its resultant modernizing influence on the Police Department, which had its inception during the administration of that distinguished American gentleman, Colonel Arthur Woods. Permit me to refer to the fact that I cannot recall a more interesting period of my career than when I was instructing the young police officers.

When a physician has spent the best days of his professional life in a public service that daily spells the slogan "Faithful Unto Death," he becomes part of the very essence of its daily functions. He knows intimately those who assume responsibilities to "do and dare;" who by fealty to their oath of office are eternally prompted by an innate courage that may be defined as "keeping the faith" with their public in performing their duties. The dignity of valor, the pride of sacrifice, and their staunch adherence to the universally known traditions of this great organization, has snatched countless numbers of these valorous souls in the glory of young manhood from the bosom of their families and transported them over the "great divide" to meet their Maker. What greater adjunct to a professional enterprise, motivated by purely humanitarian impulses could be enlisted from among the laity than this ever alert body of guardians, who are always first in the face of danger, who the public invariably look to first when confronted with distress or impending disaster?

Dr. Henderson has spoken and his instructive and enlightening discourse reflects the scientific knowledge and unceasing efforts which this gentleman has enlisted unsparingly in the cause of humanity. His contributions to science have assumed world-wide importance and his place in history and medical annals is secure. The fruits of his and Dr. Haggard's research and study "Treatment of Carbon Monoxide Asphyxia by means of Oxygen x CO₂ Inhalation" has been recognized by and received the endorsement and approbation of renowned scientists who have made a study of asphyxiation. The Inhalator was adopted by the Police Department of this city for the use

of its emergency units, following the reports of distinguished medical authorities who made an exhaustive study of this new treatment.

I make no claim to originality, nor do I seek to become identified with any of the features of this highly successful treatment. I have the honor and privilege of Dr. Henderson's friendship for the past six years, and during all the time it has been my good fortune to be associated with him, the benefit of his experience, study and advice has accounted in copious measure for what success I have achieved in bringing before the public the fruits of his and his associate's learning and endeavor that mankind would reap the benefit. That his theories, experiments, his practical mode of approaching the three major causes of asphyxiation have been successful, the records prove. Literature on this subject has been disseminated both in the United States and Canada, and within the past few years, through the unselfish and praiseworthy efforts of the Electric and Gas Utility Companies of New York, over a million people have been instructed in the application of this simple, practical, logical, life-saving agent—the Prone Pressure Method of Artificial Respiration.

In the Police Department of this city alone 18,000 pamphlets on this subject have been distributed, so that each and every member might be equipped with the latest knowledge regarding a subject with which they come in daily contact in the pursuit of their duties.

The New York Fire Department has also been the recipient of these pamphlets, as well as hospital training schools. Internes and nurses in various hospitals have also been supplied with them, the object being to spread the gospel of science and give the last word on resuscitation measures.

Reference to making the Police Department of New York City an adjunct with which to further our cause was occasioned by the following considerations:

Public utility corporations are centered in this city, greater in number and magnitude of operations than elsewhere in the nation. Other enterprises of an industrial nature, employing hundreds, where risks from asphyxiation are encountered daily, honeycomb the five boroughs. The Police Department in an effort to keep abreast with conditions attendant upon the growth and magnitude of the city's industrial enterprises and the accompanying responsibilities entailed by them, was equipped with what are termed "Police Emergency Trucks." These trucks are high powered motor cars, built on the order of fire patrol wagons, and are manned by a crew of seven men, divided into three squads, who are on duty twenty-four hours daily in eight hour shifts.

In emergencies, such as explosions, fires, accidents, and occurrences of lesser proportion where first aid is required. At the present time there are six of these trucks in daily operation in this city, and in addition to each member of the crew being trained in the Shaeffer method of resuscitation, each truck is equipped with two inhalators and the crew trained in its usage. The results achieved by this branch of the Police Department are reflected in the daily records of their activities on file in their respective stations and the Chief Surgeon's office, and bear vital testimony as to the efficacy of this treatment when properly applied by men thoroughly trained and familiar with their work. Our future efforts in the form of literature and oral discourses should be with the purpose in view of interesting Government, State and Municipal authorities throughout the land. The attention and interest of the large commercial interests as well as public utility officials should be enlisted. That the largest Police Department in the United States guarding a city of millions, wherein a multiplicity of enterprises entailing danger are carried on daily, is equipped with this life-saving device and the knowledge necessary for its proper application, and that it is resorted to almost daily with successful results, should, and would undoubtedly,

accomplish considerable towards arousing the interest of the people I have mentioned.

Nor should our efforts towards awakening interest in this treatment be confined to the channels I have mentioned. There are other outlets, which in view of present day conditions, are sadly in need of regeneration in order to cope properly with the mortality rate due to asphyxiation in our largely populated centers. The city of New York with its heterogeneous mass comprising twenty or thirty nationalities, is recognized as the largest asphyxiation grounds in the world. Here emigrants, ignorant, unfamiliar with our language and mode of living, strangers to the use of gas and electricity and the appurtenances devised for their use, swell the mortality rate, and in the squalid quarters of this city the deaths caused by accidents incidental to the use of public utilities are legion.

Here it is that derelicts on the sea of life come from the four points of the compass in a last desperate attempt to repair the ravages of fate, and failing, seek a painless path to eternity by means of gas or drowning. Here it is that hundreds embracing Father Neptune in the torrid months of the year are rescued from watery graves, only to die on beaches, docks and waterfronts because of lack of knowledge and equipment to apply artificial respiration measures.

Here it is, in the city's large and prosperous suburban area, with its quota of automobiles and private garages, that the deadly monoxide fumes from automobile exhausts have in recent years added to the deaths due to carbon monoxide poisoning. It is true that deaths due to this cause have been ascribed to accident, but with the ever mounting population and human frailty always to be reckoned with, who can foresee what the next generation may develop, and this formidable agent used as a means of self destruction or assassination.

Here it is, in a veritable maelstrom of tragedy, in a field of action calling for humanity's best efforts, that the

colleges and training schools of this country are pouring forth their quota of doctors and nurses with this vitally important factor of their training having received a comparatively negligible amount of consideration. The conditions I have cited apply, though to a lesser degree, to other large cities, hence we have a fertile and boundless area upon which to direct our efforts.

It is a well established fact that colleges and universities throughout this country, in preparing young students for the medical profession, do not devote the time and interest to this subject of asphyxiation that, in the light of recent discoveries and the fruits of modern research, the matter deserves. Graduates of medical schools have been known to enter hospitals with only a meagre knowledge of this essential factor of their training. From my experience with many, it is not stretching the truth to say that they have only been permitted to scratch the surface rather than penetrate to the fundamentals of asphyxiation. Ambulance surgeons assigned to ambulances in this city have on numerous occasions acquitted themselves in such a manner as to justify this last statement.

I need not tell you there are even professors of medicine, men who are graduated many years, and who now hold eminent places in their profession, who have not devoted the energy and study to this subject of asphyxiation which, in the light of what curative measures modern research has provided, the honor and responsibility of their calling makes imperative. Consequently they are not familiar with the advance knowledge of recent years as reflected in the Prone Pressure Method of Resuscitation and Inhalation Treatment in the salvaging of human lives from drowning, electric shock and carbon monoxide poisoning.

Dr. Cecil K. Drinker, of Harvard, takes cognizance of this regrettable situation in a highly interesting and instructive article in the *Journal of the American Medical Association*, dated April 21st, 1928, an excerpt of which I quote:

"Final control of all the great emergencies causing asphyxia and requiring resuscitation rests with the medical profession. When the physician reaches a case of asphyxiation, all other agencies must conform to his direction. His is the responsibility and on his training and experience the public must rely. Yet as a result of seven years experience in the theoretical and practical aspects of acute asphyxia, I have become convinced that physicians in general are not fairly awake to the size of the medical problem presented by asphyxia, to the latest methods of management, or to the interesting problems inherent in the condition, no matter how induced.

"Many physicians do not seem to know that the prone pressure method of artificial respiration devised by Shaeffer has entirely superseded all other methods. It is a disquieting experience for employees of public companies to be in process of giving artificial respiration entirely correctly by the prone method and to be ordered by a physician to turn the patient on his back, and then to be compelled to watch the physician give artificial respiration by the Sylvester method. As an active member of several commissions on resuscitation, I have received letters describing such experiences and asking whether employees must give way to physicians, when all evidence makes it certain that the physician advocates a wrong procedure."

With your kind indulgence I will, at this point, take advantage of the opportunity and present a screen portrayal of the correct manner of applying the Shaeffer prone pressure method of artificial respiration, as adopted by the American Gas Company and Allies. This picture was donated to the Police Department for the benefit of the recruits, and is exhibited to every class during the course of training at the Police Academy.

Another feature of the apathy of the profession in general and the ignorance of the public in regard to the subject of asphyxiation centers about the antiquated pulmotor. The impression still prevails with many physicians, and to a large extent among the lay populace, that

any form of resuscitation apparatus is a pulmotor. We all know that as a result of considerable research, the pulmotor and similar devices, which induced breathing by forcing air into the lungs and sucking it out, was discarded in favor of the Inhalator. That the Inhalator must not be confounded with the pulmotor or similar devices, is a point to be vigorously stressed in all our future activities. As a step toward correcting this false impression, I have apprised representatives of the press in New York City of the error of referring to the Inhalators in use in the Metropolis as "pulmotors" and "lung-motors," that such devices have been relegated to the scrap heap, and requested them to discontinue the use of these terms in their newspaper articles. Dr. Drinker also refers to this phase of our problem as follows:

"During the past four years a large amount of research has been directed towards improving the treatment of gas poisoning. In common with previous commissions for making a study of the subject the last commission of the American Gas Association advised strongly against the use of the pulmotor and other mechanical appliances which produced breathing by forcing air into the lungs and sucking it out. This finding was the result of re-examination of the physiologic accomplishments of the pulmotor and other apparatus of similar type. The medical profession is certainly beginning to view the pulmotor with an encouraging degree of disregard. But the device is still purchased freely, particularly by fire companies in the smaller towns, and by the unsuspecting custodians of the smaller bathing beaches. In the large communities the pulmotor is rarely seen. It continues to gain attention in the newspapers owing to the ineffaceable conviction of reporters that any form of apparatus for resuscitation is a pulmotor. Curiously enough, I have one record of a physician who objected to the use of inhalation apparatus, thinking the device a pulmotor."

I would respectfully refer you to this article by Dr. Drinker, in which the fruits of his experience in the theo-

retical and practical aspects of apsyhia are revealed. In this enlightening discourse on the three emergencies responsive to the application of the prone pressure method—asphyxiation by drowning, electric shock and carbon monoxide poisoning, the learned doctor gives a lucid portrayal of the destructive bodily processes induced by these three causes, the symptoms present in the various phases of asphyxiation, and serves more than ever to convince his readers that physicians in general are not keeping step with the march of progress in their treatment of the medical problems involved in these major emergencies.

Men possessing the sterling qualities, the scientific attainments and unselfish aspirations of Dr. Drinker are invaluable assets of this association, and it is only with the fruits of their unceasing study and research that we may hope to wield the mighty influence for the good of mankind that is our ambition. Only the widespread dissemination of such informative articles as Dr. Drinker will serve to sow the seeds of knowledge among physicians in general of the medical problems involved in asphyxiation. This in turn would serve to illustrate convincingly the logicity of the prone pressure method of artificial respiration in asphyxiation caused by drowning and electric shock, and its application in conjunction with inhalator in the treatment of carbon monoxide poison.

An eloquent testimonial to the efficacy of the Inhalator and the Shaeffer prone pressure method of resuscitation is contained in a circular issued by the Consolidated Gas Company of this city to its stockholders, which I quote:

“For relief from electric shock, carbon monoxide poisoning, submersion, or other injuries resulting in suspended respiration, there has yet to be discovered a better method of resuscitation than the one known as the ‘Shaeffer Prone Pressure Method.’

“This method has recently been approved by all of the large national bodies interested in safety work, as well as the National Gas and Electric Associations and frequently we receive reports of its accomplishments. Only

recently a New York policeman was found by one of our emergency crews applying this method with the aid of a little descriptive booklet opened beside him which he had received only the day before. This effort saved the victim's life.

"Because of the results obtained through this effective life-saving formula, all of our employees (30,000) are now receiving instruction in its simple application, thus making a formidable army of 'first aid' servants."

Referring to the emergency crews maintained by the Consolidated Gas Company the circular further reads:

"The men are experts in the application of the Shaeffer prone pressure method of resuscitation, and the cars are equipped with inhalators, a mechanical device, which are used in poisonous fume cases to help restore breathing by the use of oxygen and carbon dioxide. During the year 1926 these crews answered approximately 18,300 emergency calls of every description from fire alarms to applying the inhalator to new born babes who had stopped breathing."

While the modern method of resuscitation represents giant strides in combatting asphyxiation, the after effects of this condition present factors responsive only to the utmost skill and alertness of the physician in attendance. This is particularly applicable following asphyxiation from carbon monoxide poisoning and immersion. Consideration of the deleterious effects which frequently develop as an aftermath of these emergencies serves to convince one that the attending physicians must be ever on the alert to guard against complications of a serious nature developing, and thus assure the patient's trend to normal convalescence.

After re-establishing the normal mechanism of breathing by the prone pressure method of resuscitation in conjunction with inhalation, attention should be concentrated on possible weakened heart function, hypostatic pneumonic

effusion in the pleural cavity, oedema of the brain and impairment of kidney function. Hence the attending physician on hospital service and the internist must be on the alert to detect these conditions in their incipency that they may put forth their best efforts to cut down morbidity. The laboratory technician too, in his rôle of analyst in blood chemistry bears an important function in bringing about convalescence.

This highly important field of medicine will receive recognition as holding a high rank in scientific developments. I believe it might not be an exaggeration to envision Resuscitation Consultants in the city hospitals as the next step forward in combatting mortality.

Hence I cherish the hope that our activities in the field of asphyxiation treatment will develop into a dominating factor in bringing about in the not far distant future a harmonious co-operation between the general practitioner, laboratory technician, attending physician, internist and ambulance surgeon, following the humane and intelligent "first aid" efforts of the Police Department, Fire Forces and public utility crews.

The profession in general must be aroused from the lethargy which characterizes its attitude toward this subject, and the public too, must be awakened to a sense of its responsibility. The formulation of efficacious plans of enlisting the enthusiasm of the profession is imperative and warrants earnest thought and consideration. To mould the public into a vast army of active allies in the cause presents a less formidable task. Enlisting the co-operation of Police and Fire Departments here and there as well as public utility corporations is all very well in itself, but our efforts should not end there. This is not delving to the crux of the situation, but is a mere scratching of the surface, as it were. The Federal, State and Municipal authorities should be brought face to face with this matter to the end that the masses are reached. With their co-operation this training could be included in the educational programme of every public and private school,

nurses training school and the scores of other educational institutes wherein our youth are being prepared to launch their careers. Through their instrumentality ambulances, fire apparatus and other official vehicles used in emergencies could be equipped with inhalators, and every licensed bathing establishment could be obliged by law to be so equipped. Their co-operation would tend to facilitate engaging the interest of utility corporations and large private industrial enterprises, not alone to the extent of training their employees in prone pressure methods, but also equipping their plants with inhalation apparatus, thus having it available for immediate use and not losing precious minutes pending the arrival of one from outside sources.

This subject too, presents an economic factor of tremendous proportions to the life insurance companies throughout the land. In this field alone much progress can be made in the advancement of our cause and no effort should be spared to obtain their interest. With these gigantic institutions allied with us the millions comprising their policy-holders could be moulded into a vast army of potential life-savers.

After having devoted thirty-five years of my professional career in the service of the public, I know of no nobler project for the benefit of mankind, that encompasses greater possibilities for good, both from a medical and humanitarian standpoint, than the subject before this meeting. It has intrigued my deepest interest and enthusiasm. Over seven years ago I discontinued teaching the Sylvester method of artificial respiration in my department, and adopted the Shaeffer method in its stead. Hence, when in July 1925, the Police Department of this city inaugurated the present emergency truck system, enabling me to put the Inhalator to practical use in the most fertile field in the universe—the giant Metropolis—I believe much was accomplished toward the ultimate attainment of the universal adoption of this treatment. In my capacity as Chief Surgeon of the Police Department of this city, I

have put forth all the energy at my command to create a spirit of harmony and co-operation between the units of the Police and Fire Departments, Gas and Electric Lighting Corporations and the city hospitals, with the result that they are functioning as one smooth running machine, attaining the maximum of results with a minimum of friction in combatting these three great emergencies. Hence it is that I am asking your earnest co-operation to the end that this treatment will become the object of world-wide interest and eventual adoption, and thus be placed in its proper sphere in the front ranks of Twentieth Century accomplishments.

COMMITTEE ON PROFESSIONAL STANDARDS

It has always been the hope and expectation of the Council of The New York Academy of Medicine and a large part of the Fellowship that the Fellows of the Academy would recognize the importance of maintaining the best medical traditions of the profession and of comporting themselves in accordance therewith.

Only in recent years have reports been brought to the attention of the Council that some of the Fellows seemed to be forgetful of the traditions of the Academy and the obligations which go with the privileges of Fellowship, in that their conduct does not fully reflect the best interests of the Academy. These matters have been the subject of discussion at meetings of the Council and at the regular December meeting, authorization was granted for the appointment of a special committee on Professional Standards. This Committee consists of Dr. Samuel W. Lambert, Chairman, and Drs. Beer, Cannon, Osgood, Parsons, Samuels and Wright with the President and Director.

The Committee was asked to make inquiries on its own initiative and to receive any complaints of undignified conduct that might be made against a Fellow. The Academy has never laid down any code of ethics and in the discussions at the Council meetings, it was the consensus of opinion that ethical conduct is wholly embraced in the phrase, "conduct becoming to a gentleman and a physician" which of necessity in no way runs counter to the best interests of the medical profession and the public it serves.

The Committee on Professional Standards has held regular monthly meetings and has considered a large number of cases coming under its jurisdiction. Hearings have been granted to each Fellow complained of and recommendations made to the Council. In two instances, the Council has reprimanded a Fellow in accordance with Article IX, Section 1, of the Constitution of the Academy, which authorizes the Council to reprimand or suspend a Fellow.

A large number of the complaints which have been considered relate to aiding or permitting the publication of special articles in the lay press which invite undesirable attention to the physician. It is well recognized that advertising has enormously increased, particularly in the daily press and it is known that the newspapers are subject to keen competition and that the editor has become a business man who must make money for his corporation, whereas he was formerly an independent individual and a leader of opinion in his community. The newspaper staff seeks news from all fields of human endeavor and many medical items are good "news." One of the results of this change in conditions has been the constant attempt on the part of the press to report items of medical interest and the names of the physicians connected with them. Such newspaper comment undoubtedly may be interpreted in terms of advertising for a physician and it is believed by the Council that a small number of the Fellows of the Academy have succumbed to the importunities of press representatives and have aided or permitted the publication of articles or statements about themselves. It is recognized by all thoughtful, high-minded men that such practices unfavorably affect the interests of the medical profession as well as the public and that if free rein is permitted to publicity and advertising by physicians, the public will be betrayed into the hands of the most clever advertiser without regard to his professional efficiency.

It has not been the daily press alone which has persuaded physicians to grant statements, but also lay magazines and the radio. In many instances there seems to be a confusion in the minds of some, between the issuance of medical information through proper channels, such as statements made by health department officials, voluntary health agencies, non-practicing physicians in laboratories and medical schools, which are made for educational purposes on the one hand and on the other, the publication of statements about practitioners which may contain accurate medical information but invite attention to themselves and smack unpleasantly of an attempt to place their pro-

fession on the basis of a commodity to be sold by reason of a trade mark.

It is also recognized by the Council that the writings of physicians are quoted in the press, sometimes inaccurately, and that on some occasions interviews with physicians have been published which have neither been granted nor authorized by the physician.

The Council of the Academy has been unwilling to adopt any inflexible regulations for the control of this situation, but at a meeting held on April 24, 1929, it adopted a series of resolutions on the subject of addresses to lay audiences, articles published in lay magazines and newspapers, and radio talks made by Fellows of The New York Academy of Medicine and also the use of Fellows' names as testimonials for advertising purposes, to which it hopes the Fellows will adhere.

The Council expects that the Fellows of the Academy will cooperate in furnishing the public with accurate information on medical matters and advises the Fellows that the Medical Information Bureau was established in conjunction with the Medical Society of the County of New York in 1928 for this specific purpose.

Following are the resolutions which were adopted :

1. that the Council of the Academy approves of Fellows giving addresses over the radio on medical subjects provided that the subject matter be typewritten and submitted to the Medical Information Bureau for editing and approval at least two weeks prior to the giving of the address. This should include information concerning the Fellow, given for the purpose of introduction by the announcer.
2. that when such an address is given with the approval of the Medical Information Bureau, it may be announced that it is given with the approval of The New York Academy of Medicine.
3. that when time of the Health Speakers Service is available, the Academy approve of addresses being made under these auspices.
4. that when radio time is offered by industrial corporations, the Medical Information Bureau consider each case on its merits, and that no Fellow should give a radio address under commercial auspices without the approval of the Medical Information Bureau.

5. that the Council call the attention of the Fellowship to the undesirable results following the giving of interviews by Fellows of the Academy for publication in the lay press. If any Fellow deems such an interview desirable the press representative should be referred to the Medical Information Bureau.
6. that if a Fellow of the Academy has made a new discovery, developed a new medical procedure, or desires to report an unusual medical case, such information should always be reported first at a medical meeting or in a medical journal.
7. that the Council also appreciates that there are many medical meetings at which arrangements are made for reporting the proceedings in the daily press and that such publicity is given under the control of the society and there is no objection to this procedure.
8. that if a Fellow is the author of a paper on a subject of public interest, he should send a copy or abstract of his paper to the Medical Information Bureau, which may give out a release on the subject to the lay press if it believes it to be desirable. It is requested that Fellows of the Academy will follow this procedure whether their papers are read before the Academy or one of its Sections, or before any other meeting, unless the procedure mentioned in paragraph 7 is carried out.
9. that the use of a Fellow's name in the form of a testimonial for advertising purposes is contrary to the traditions and the best interests of the Medical Profession and should under no circumstances be granted.

It is suggested, therefore, that in all questions of doubt, the Fellow confer with the Secretary of the Medical Information Bureau, Dr. Iago Galdston, Telephone, Caledonia 2240.

PROTECTION OF PATIENTS' CONFIDENTIAL
RECORDSACADEMY ACTION IN RECENT BIRTH CONTROL CLINIC
SEIZURES

The Council of the Academy was deeply concerned over the arrest of Drs. Hannah M. Stone and Elizabeth Pissoort, who were working at the Birth Control Clinic, and the seizure of patients' records. This was of such importance that a special meeting of the Council was held on April 22 to consider the matter. This meeting first received a report of the Executive Committee of the Committee on Public Health Relations which had discussed the matter in detail the same day. The Council at this special meeting took the following action: approved of giving out to the press a very brief statement announcing that a special committee had been appointed to investigate the matter further; authorized the sending of a letter of inquiry to the Police Commissioner and took the advice of the counsel, Mr. Frank L. Polk, on the entire situation.

On April 23, with the approval of the Committee, a letter was sent to the Police Commissioner and a reply received from him on April 24, both of which letters were presented to the Council on April 24.

The Council has directed that the correspondence and the report of the special committee which was approved at this meeting be printed in the Bulletin. The correspondence and report follow.

The Honorable Grover A. Whalen
Commissioner of Police
New York City

April 23, 1929

Dear Sir:

The New York Academy of Medicine has viewed with considerable concern the events connected with the arrest of Dr. Hannah M. Stone and Dr. Elizabeth Pissoort with three nurses, and the seizure of their records.

The Executive Committee of the Committee on Public Health Relations, and the Council, which is the governing body of the Academy of Medicine, held special meetings on April 22 to consider what action should be taken, if any. At these meetings, very serious apprehension was expressed, largely

based upon the press statement of Judge McAdoo, that the police had exceeded their authority in the seizure of irrelevant records and thereby had set a precedent which, if allowed to go uncorrected, would have very serious effects. Since, however, the Council was not in possession of all the facts, it voted to take no final action but to refer the matter to a special committee for the purpose of getting all the information possible, for presentation to the Council at its regular meeting at 4:30 on Wednesday afternoon, April 24.

This Committee, consisting of John A. Hartwell, James Alexander Miller, W. L. Niles and Foster Kennedy, therefore, is addressing this letter to you with the request that, insofar as possible, you will inform it concerning certain questions which have been raised.

The Medical Profession has always jealously guarded the records between themselves and their patients as confidential and inviolable, unless such records were needed to actually aid in the detection or investigation of crime. In this particular instance Dr. Stone and possibly her associates had been accused of committing an offense under the penal code; and the right of the police to get documentary evidence in connection with this specific complaint is recognized. The question raised, is, why was it necessary to do more than get the one record in support of this complaint? It is reported to us that this individual record was the first one seized, before any other action had been taken and that, subsequent to it, other records totalling a large number and having no relation to the case, were also seized.

A second question raised is, whether this action of the authorities was not, in fact, an attempt to interpret the meaning of the statute as to what shall constitute a valid reason for giving contraceptive advice. The wording of the statute and court decisions in connection therewith seem to leave this entirely at the discretion of the doctor and, unless there is definite evidence that a doctor is giving contraceptive advice other than for reasons of health and the cure and prevention of disease, he is acting well within his rights. Testimony given by policewoman McNamara before Magistrate Rosenbluth is evidence that she sought such advice from the doctors solely on the grounds of her health and that, after a thorough study of her condition and examination of her person was made, the doctors definitely determined that her health would be jeopardized if she again became pregnant at this time. The question on which we were asked to obtain information, if proper, is, why under these circumstances it was necessary to consider the complaint and does it represent an attempt to influence the doctors and their freedom of action?

The Academy is very jealous of the proper behavior of the members of the Medical Profession and, at the present time, is engaged in an active campaign to raise the standards of medical practices, and will always be in favor of using its influence to discover and correct any irregularities in such practices. It is equally jealous, however, for reasons of public good, in protecting the privileges and interests of the profession in the proper performance of their professional duties.

We are very desirous of taking no steps that may not be of advantage toward the accomplishment of both of these ends. In the present situation the Academy is gravely apprehensive that both the rights and privileges of the Medical Profession and the good of the community have been seriously threatened and, before publicly expressing any such view, the Academy is anxious to be fully informed.

This letter is, therefore, addressed to you personally, with the hope that you will be able to help us in arriving at correct conclusions; and no pronouncement will be given to the public until we feel that we have exhausted all sources of information.

We trust that you will feel it proper to cooperate with us in this purpose.

Very sincerely yours,

(Signed) LINSLEY R. WILLIAMS, M.D.,

Director,

For the Committee.

POLICE DEPARTMENT
CITY OF N. Y.

April 24, 1929

Linsley R. Williams, Director
The New York Academy of Medicine
2 East 103rd Street
New York City

Dear Dr. Williams

Your favor of April 23 is acknowledged. After careful investigation of the case referred to—the arrest of Dr. Hannah M. Stone and Dr. Elizabeth Pissort with three other nurses, and the seizure of their records—I find the following to be the facts:

1. A complaint was lodged with the Women's Bureau of the Police Department alleging certain violations of the provisions of Section 1142 of the Penal Law of the State of New York
2. The Director of the Women's Bureau assigned a policewoman to investigate the complaint and report thereon
3. The investigation and the report of the policewoman was brought to the attention of the District Attorney's Office by the Director of the Women's Bureau
4. An Assistant District Attorney was assigned to the case and prepared the affidavit of the policewoman
5. The Assistant District Attorney, the Director of the Women's Bureau and the policewoman thereafter called upon the Chief City Magistrate and applied for the necessary warrants
6. The Chief City Magistrate, after listening to the facts in the case and examining the affidavit, issued a search warrant and a warrant of

arrest calling for the apprehension of the individuals named in the affidavit of the policewoman and the seizure of the property described in the search warrant

7. The execution of the warrants were carried out by the following members of this Department under supervision of an Assistant District Attorney at premises 45 West 15th Street:

The Director of the Women's Bureau
The policewoman making the affidavit
Several other detectives

This complaint was treated in a purely routine way by the Director of the Women's Bureau who received it. In this procedure she erred, since a grave question of public policy was involved and the matter should have been brought to the attention of the Police Commissioner at its inception.

The Police Commissioner agrees absolutely with the opinion of the Academy of Medicine that the relationship between patient and physician should forever remain inviolate, and that the authority best equipped to pass upon the behavior of members of the medical profession is a body such as the Academy of Medicine.

May I thank you for your courteous letter, and assure your society that if at the conclusion of the investigation which is now in progress it is found that the police officers executing the warrants exceeded the authority of the warrant of seizure, prompt and proper disciplinary action will be taken by the Police Commissioner.

Very sincerely yours

(signed) GROVER A. WHALEN
Police Commissioner.

REPORT OF THE SUB-COMMITTEE OF THE COUNCIL

Your Committee, Drs. James A. Miller, Walter L. Niles, Foster Kennedy, and the President, Dr. John A. Hartwell, in conjunction with Dr. Williams, the Director, has made a thorough investigation of all the obtainable facts in relation to the matter that they were requested to report on, namely, the events connected with the arrest of Drs. Stone and Pissoort and the seizure of certain records belonging to their office. This investigation includes a letter addressed to the Police Commissioner and his answer thereto which are herewith submitted and which the Commissioner has made public.

Drs. Kennedy and Hartwell attended the hearing held in the Magistrates Court before Magistrate Rosenbluth this morning.

As a result of this investigation, your Committee is of the opinion that there are many factors connected with this situation which gravely menace the freedom of the medical profession within legal qualifications for the care and treatment of their patients.

The reason for this belief arises from the fact that the entire case is centered around the competency of physicians to arrive at conclusions concerning diseased conditions and their ability and honesty of purpose in advising treatment for such conditions.

In addition to this your Committee views with grave concern any action on the part of the authorities which contravenes the inviolability of the confidential relations which always have and should obtain between physicians and their patients unless such action is directly related to the detection or prosecution of crime. In the instance before us, there is no evidence whatever that the seizure of any records other than those directly connected with the alleged breach of law could in any way have a bearing upon that particular issue.

Under these circumstances, the Committee recommends that the Academy register its apprehension that unless adequate steps are taken to prevent similar conditions arising in the future, there exists a definite threat against the public good and a serious menace to the rights and privileges of the medical profession as granted by law.

It further recommends that the Academy register its protest against any action by those in authority which may result in an unwarranted interference with the freedom of physicians engaged in the lawful practice of medicine or the violation of the privileged character of all records pertaining to the relation of a physician and his patient, except in the detection or prosecution of crime.

This report is submitted to the Council with the recommendation that it be approved and published in the Academy Bulletin.

In adopting and approving the report of the sub-committee, the Council on April 24th, studied with attention the correspondence between the Committee and the Police Commissioner and voiced its appreciation of the Commissioner's willingness to cooperate in protecting the interests of the public and of the medical profession in their mutual relations.

COMMITTEE ON MEDICAL EDUCATION

FOURTH SERIES OF AFTERNOON LECTURES—1929-1930

November

- 1st—Interpretation of kidney function in clinical practice.
Dr. Herman O. Mosenthal.
- 8th—Parasitology from the clinical standpoint.
Dr. F. W. O'Connor
- 15th—Present day treatment of syphilis with a consideration of the comparative value of remedies employed.
Dr. Jay F. Schamberg, Philadelphia.
- 22nd—The relation of orthopedics to pediatrics.
Dr. Frank R. Ober, Boston.

December

- 6th—The psychic factor in cardiac disorders.
Dr. Lewis A. Conner.
- 13th—Acidosis and the water exchange.
Dr. John P. Peters, New Haven.
- 20th—Inheritance as a factor in disease.
Dr. Raymond Pearl, Baltimore.

January

- 10th—Cancer as a world problem in relation to preventive medicine, periodic examinations and public health.
Dr. Joseph C. Bloodgood, Baltimore.
- 17th—Causes and treatment of failing circulation in middle life.
Dr. David Riesman, Philadelphia.
- 24th—The Eye in relation to general medicine.
Dr. Edgar S. Thomson.

February

- 7th—The Diagnosis and treatment of meningococcus meningitis.
Dr. Stafford McLean.
- 14th—The premarital examination and conjugal adjustments.
Dr. Robert L. Dickinson.
- 21st—Mental hygiene.
Dr. Arthur H. Ruggles, Providence.
- 28th—Specific hypersensitiveness as a cause of symptoms in disease.
Dr. Arthur F. Coca.

March

7th—The treatment of nephritis.
Dr. Rolfe Floyd

14th—The diagnosis and treatment of cerebral neoplasms.
Dr. Charles A. Elsberg.

21st—Obstetric subject.
Dr. Benjamin P. Watson.

28th—The treatment of general infections of the bloodstream.
Dr. Alphonse R. Dochez.

April

4th—Diseases of the arteries of the extremities and their treatment.
Dr. Leo Buerger.

11th—Drug addiction.
Dr. Alexander Lambert.

LIBRARY NOTES

LIBRARY HOURS DURING THE SUMMER

From June 15 until September 15 inclusive, the Library will be open on week days from 9 a. m. to 5 p. m., on Wednesdays from 9 a. m. to 10:30 p. m., and on Sundays from 10 a. m. to 5 p. m.

AN S. O. S. FROM VENICE 380 YEARS AGO

In the Venetian palace of The New York Academy of Medicine on Fifth Avenue there reposes among other antique book treasures a fine volume printed in Venice in 1549. On the title page of this folio there is a printer's device which we here reproduce. It displays proudly a large S. O. S.



The question arose as to its possible connection with the familiar symbol by which ships in distress signal for help, to "Save Our Souls" as it is popularly put. Did the Venetians of the time of Titian's masterpieces, when they indeed "ruled the waves" know our S. O. S.? It does look so. There it is closely interlinked with the growths of the earth and the anchor of the ship. From its center there rises in a conical bundle the distressed vibrations crying for help, explained in the inscription on the ribbon: "In tenebris fulget," it sparkles in the dark. And perhaps in the little flying things around the S. O. S. can we see anticipations of help brought through the air? A very tempting theory!

But alas there is the scientific bibliographer immediately ready to destroy so pretty an explanation. He says that O.S.M. is a familiar mark of a famous publisher of Venice, one Octavianus Scotus of Modena, who issued many fine books more than 400 years ago. Other bearers of the name Scotus followed him in the business, so one Jerome in 1549, the date of our book and in the device he linked his S with that of his famous predecessor O.S. Too bad, it would have made such a pretty vignette on the Academy of Medicine's stationery for S. O. S. calls to its friends for aid in the acquisition of new treasure books.

ARNOLD C. KLEBS.

RECENT ACCESSIONS TO THE LIBRARY

- Adler, A. *Die Technik der Individualpsychologie.*
München, Bergman, 1928, pt. 1.
- Anderson, H. B. *The facts against compulsory vaccination.*
N. Y., Citizens med. ref. bur., [1929], 127 p.
- Bakker, C. *Volksgeneeskunde in Waterland.*
Amsterdam, Paris, 1928, 631 p.
- Ball, J. M. *The sack-'em-up men.*
Edinburgh, Oliver, 1928, 216 p.
- Barry, I. *Portrait of Lady Mary Wortley Montague.*
[London], Benn [1928], 294 p.
- Birk, W. *Leitfaden der Kinderheilkunde. Teil 2. Kinderkrankheiten.*
3. Aufl., Berlin, Marcus, 1928, 384 p.
- Birkenhead, F. E. S., 1st Earl. *More famous trials.*
London, Hutchinson, [1928], 310 p.
- Blatz, W. E. & Bott, H. M. *Parents and the pre-school child.*
London, Dent, 1928, 306 p.
- Blondel, C. *The troubled conscience and the insane mind.*
London, Paul, 1928, 91 p.
- Boas, F. *Materials for the study of inheritance in man.*
N. Y., Columbia Univ. Pr., 1928, 540 p.
- Boeckh, G. *Die kritischen Jahre der Frau.*
Stuttgart, Strecker, [1928], 111 p.
- Borderieux, C. *Almost human.*
London, Bell, 1928, 78 p.
- Bragg, (Sir) W. *An introduction to crystal analysis.*
London, Bell, 1928, 163 p.
- Brain, W. R. & Strauss, E. B. *Recent advances in neurology.*
Phil., Blakiston, 1929, 412 p.
- Buschan, G. *Im Anfang war das Weib. Neue Beiträge zur Menschen- und Völkerkunde.*
Dresden, Reissner, 1927, 3 v.
- Burns, D. *An introduction to biophysics.*
2. ed., London, Churchill, 1929, 580 p.
- Chadwick, M. *Difficulties in child development.*
London, Allen, [1928], 411 p.
- Coghill, G. E. *Anatomy and the problem of behaviour.*
Cambridge [Eng.], Univ. press, 1929, 113 p.
- Cole, S. W. *Practical physiological chemistry.*
8. ed., Cambridge, Heffer, 1928, 479 p.
- Critchley, M. *Mirror-writing.*
London, Paul, 1928, 80 p.
- Cruchet, R. *Encephalite épidémique.*
Paris, Doin, 1928, 133 p.
- Danckwortt, P. W. *Lumineszenz-Analyse im filtrierten ultravioletten Licht.*
Leipzig, Akad. Verlagsgesellschaft, 1928, 106 p.

- Darwin, L. What is eugenics?
London, Watts, 1928, 88 p.
- Dawson, W. S. Aids to psychiatry.
2. ed., London, Ballière, 1928, 312 p.
- Descoeurdes, A. The education of mentally defective children.
London, Harrap, [1928], 312 p.
- Dorsey, G. A. The evolution of Charles Darwin.
London, Allen, [1928], 300 p.
- Douthwaite, L. C. Mass murder.
N. Y., Holt, [1929], 313 p.
- Forrester, C. R. G. Imperative traumatic surgery.
N. Y., Hoeber, 1929, 464 p.
- Francé, R. H. Der Organismus: Organization and Leben der Zelle.
München, Drei Masken Verlag, 1928, 296 p.
- Grenfell, (Sir) W. T. Labrador looks at the Orient.
London, Jarrolds, [1928], 102 p.
- Gunter, F. E. Tuberculin in practice.
London, Gregg, [1928], 102 p.
- Haab, O. An atlas of ophthalmoscopy.
London, British optical assoc., [1928], 230 p.
- Haldane, J. S. Gases and liquids.
Edin., Oliver, 1928, 334 p.
- Halliburton, W. D. & McDowall, R. J. S. Handbook of physiology.
18. ed., London, Murray, [1928], 902 p.
- Hammer, B. W. Dairy bacteriology.
N. Y., Wiley, 1928, 473 p.
- Hári, P. Kurzes Lehrbuch der physiologischen Chemie.
3. . . Aufl., Berlin, Springer, 1928, 407 p.
- Haskins, C. H. Studies in the history of mediaeval science.
2 ed., Cambridge, Harvard Univ. pr., 1927, 411 p.
- Hopewell-Ash, E. On keeping our nerves in order.
London, Mills, [1928], 126 p.
- Hutton, (Mrs.) I. E. With a woman's unit in Serbia, Salonika and Sebas-
topol.
London, Williams, [1928], 302 p.
- Ibotson, E. C. B. Partnerships, combinations and antagonisms in disease.
Phil., Davis, 1929, 348 p.
- Index (An) of symptomatology... Edited by H. L. Tidy.
Bristol, Wright, 1928, 710 p.
- Jung, C. G. Contributions to analytical psychology.
London, Paul, 1928, 410 p.
- Kelley, I. V. Questions and answers for nurses.
Phil., Saunders, 1929, 354 p.
- Klüver, H. Mescal, the 'divine' plant and its psychological effects.
London, Paul, 1928, 111 p.
- Lecher, E. Lehrbuch der Physik für Mediziner, Biologen und Psychologen.
5. . . Aufl., Leipzig, Teubner, 1928, 469 p.

- Lereboullet, P. & Boulanger-Pilet, G. Manuel clinique et thérapeutique de la diphtérie.
Paris, Baillière, 1928, 321 p.
- Lewis, (Sir) T. Clinical electrocardiography.
4. ed., London, Shaw, 1928, 128 p.
- Lord, F. T. Pneumonia.
[2. ed.?], Cambridge, Harvard Univ. pr., 1929, 84 p.
- Low, B. Psycho-analysis and education.
N. Y., Harcourt, 1928, 224 p.
- Lowry, G. A place among men.
London, Mondiale, [1928], 73 p.
- Mairet, P. A B C of Adler's psychology.
N. Y., Greenberg, [1929], 116 p.
- Malinowski, B. The sexual life of savages in north-western Melanesia.
London, Routledge, 1929, 505 p.
- Marinus, D. Alloquia; experiences & some reflections of a medical practitioner.
London, Daniel, [1928], 151 p.
- Minor, W. E. Clinical proctology.
St. Louis, Mosby, 1929, 258 p.
- Monar, C. L. & Böhme, A. In vier Wochen nicht mehr nervös.
Oldenbourg i. O., Schwartz, [1928], 164 p.
- Montague, J. F. Taking the doctor's pulse, and another essay.
Phil., Lippincott, [1928], 44 p.
- Prince, M. Clinical and experimental studies in personality.
Cambridge, Sci-art pub., 1929, 559 p.
- Pryde, J. The A B C of vitamins.
London, Hamilton, [1928], 128 p.
- von Richter, V. Chemie der Kohlenstoffverbindungen oder organische Chemie.
12. Aufl. Bd. 1, Leipzig, Akad. Verlag...1928, 882 p.
- Rolleston, (Sir) H. D. Aspects of age, life and disease.
London, Paul, 1928, 304 p.
- Romeis, B. Taschenbuch der mikroskopischen Technik.
12...Aufl., München, Oldenbourg, 1928, 717 p.
- Schleip, K. & Alder, A. Atlas der Blutkrankheiten.
2. Aufl., Berlin, Urban, 1928, 174 p.
- Schoen, M. The problem of fermentation.
London, Chapman, 1928, 211 p.
- Schreiber, G. La médecine préventive usuelle.
Paris, Masson, 1928, 384 p.
- Sharpe, W. & Sharpe, N. Neurosurgery.
Phil., Lippincott, [1928], 762 p.
- Simms, W. & Norman, H. W. Manual of dental prosthetics.
Manchester, Sherratt, 1928, 346 p.
- Singer, G. Die Reizkörperbehandlung des Diabetes.
Berlin, Urban, 1929, 200 p.

- Stenvers, H. W. Röntgenologie des Felsenbeines und des bitemporalen Schädelbildes.
 Berlin, Springer, 1928, 278 p.
- Stevens, E. F. The American hospital of the twentieth century.
 3. ed., N. Y., Dodge, 1928, 549 p.
- Stillson, W. C. Dental anatomy.
 Phil., Saunders, 1929, 280 p.
- Stitt, E. R. The diagnostics and treatment of tropical diseases. ..
 5. ed., Phil., Blakiston, [1929], 918 p.
- Stoloff, C. I. Your teeth.
 N. Y., Dutton, [1929], 224 p.
- Textbook, (A) of medicine... Edited by J. J. Conybeare.
 Edinburgh, Livingstone, 1929, 976 p.
- Verain, M. & Chaumette, J. Le pH en biologie.
 Paris, Masson, 1928, 159 p.
- Weiss, H. B. & Isaacs, R. Manual of clinical and laboratory technic. 3. ed.
 Cincinnati, Cincinnati general hospital, 1927. 78 p.
- White, R. P. The dermatergoses, or occupational affections of the skin.
 3. ed.
 London, Lewis, 1928, 734 p.
- Widdowson, T. W. Notes on dental anatomy and physiology and dental histology (human and comparative).
 5. ed., London, Bale, 1928, 588 p.
- Willstätter, R. Untersuchungen über Enzyme.
 Berlin, Springer, 1928, 2 v.

PROCEEDINGS OF ACADEMY MEETINGS

APRIL

STATED MEETINGS

Thursday Evening, April 4, at 8:30 o'clock

Program presented in cooperation with the Section of Pediatrics

ORDER

I. EXECUTIVE SESSION

Election of Fellows

II. PAPER OF THE EVENING

Studies in the experimental production of abscess of the lung, Elliott C. Cutler, Professor of Surgery, Western Reserve Medical School, Lakeside Hospital, Cleveland (by invitation)

Discussion, H. A. Bray, Superintendent, New York State Hospital for Incipient Tuberculosis, Ray Brook, New York (by invitation)

III. EXECUTIVE SESSION—SECTION OF PEDIATRICS

Nomination of officers and Advisory Committee

Thursday Evening, April 18, at 8:30 o'clock

THE EIGHTH HARVEY LECTURE

The pathogenesis and transmission of tuberculosis

Eugene L. Opie

Professor and Director of the Department of Pathology, School of Medicine, and Director of Laboratories, The Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis, University of Pennsylvania

Peyton Rous, President
Harvey Society

Philip D. McMaster, Secretary
Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for April.

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, April 2, at 7:45 o'clock

ORDER

I. PRESENTATION OF PATIENTS

- (a) Cases from the Post Graduate Medical School and Hospital
- (b) Miscellaneous cases

II. DISCUSSION

III. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

NOTE:—The examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, April 5, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. 1. Fracture of humerus with non-union
 2. Osteomyelitis of femur with secondary diagnosis of chondrodysplasia, James H. Heyl (by invitation)
 - b. Carcinoma of sigmoid colon, delayed diagnosis, John J. Westermann, Jr.
 - c. 1. Acute hemorrhagic pancreatitis complicating cholelithiasis.
 2. Primary typhoid empyema of the gall-bladder, Phillip J. Lipsett
- III. PAPER OF THE EVENING
On the possibility of relieving some kinds of abdominal pain by the section of the sympathetic rami-communicantes, F. A. C. Scrimger, Montreal (by invitation)
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION
Nomination of officers and Advisory Committee

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, April 9, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. CLINICO-PATHOLOGICAL PRESENTATION
Brain abscess following pyemia of many years' duration, Charles Davidson (by invitation)
- III. PAPERS OF THE EVENING
 - a. The study of normals, Theodore H. Weisenburg, Philadelphia (by invitation)
 - b. Adaptation of the nervous system following lesions of the brain, Theodore H. Weisenburg, Philadelphia (by invitation)Discussion, Frederick Tilney, Smith Ely Jelliffe, Walter Timme, Louis Casamajor, Michael Osnato
- IV. EXECUTIVE SESSION
Nomination of officers and Advisory Committee

SECTION OF OTOTOLOGY

Friday Evening, April 12, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES

III. PAPER OF THE EVENING

Surgical anatomy of the temporal bone—lantern demonstration, George E. Shambaugh, Chicago (by invitation)

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

SECTION OF OPHTHALMOLOGY

Monday Evening, April 15, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICAL CASES

- a. Presentation of a case of hereditary nystagmus, Willis S. Knighton (by invitation)

III. PAPERS OF THE EVENING (9 p.m.)

- a. Hemorrhages in the fundi in hypertension, Fritz Lange, Munich (by invitation)
- b. Dermatology of the eye, Charles Mallory Williams
- c. Ocular pathology of periarteritis nodosa, Isadore Goldstein, David Wexler (by invitation)

IV. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

SECTION OF MEDICINE

Tuesday Evening, April 16, at 8:30 o'clock

ORDER

Program presented by the Medical Staff of Mt. Sinai Hospital

I. PAPERS OF THE EVENING

- a. The cause of right heart hypertrophy and right heart failure in kyphoscoliosis, George Baehr
- b. Aspiratory pulmonary suppuration: clinical and experimental, J. Harkavy
- c. A study of hypertension. Characteristic electrocardiographic and roentgenographic findings with their prognostic significance, Arthur M. Master.
- d. The natural history of acute glomerulonephritis, Eli Moschcowitz
- e. Distribution of bacteria in the blood stream, R. Ottenberg
- f. The excretion of neutral red in the stomach in achylia gastrica, Asher Winkelstein
- g. Visceral crises of the erythema group, Daniel Poll
- h. Polyarthrititis from wound infections, B. S. Oppenheimer

II. DISCUSSION

III. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

SECTION OF GENITO-URINARY SURGERY

Wednesday, April 17

Afternoon Program

2-4 o'clock—Surgical clinics, The Long Island College Hospital, Henry Street, Brooklyn; The Brooklyn Hospital, Raymond Street and De Kalb Avenue

Evening Program

The New York Academy of Medicine at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

From the Department of Urology, Brooklyn Jewish Hospital

- a. Two interesting cases of kidney disease, Abraham Ravich (by invitation)

From the Department of Urology, Long Island College Hospital

- b. Kidney resection for sacculated calyx, Augustus Harris (by invitation)
 - c. Three cases of uric acid calculi non-opaque to x-rays, Fedor L. Senger (by invitation)
 - d. Traumatic vesico-rectal fistula; operation and result
 - e. The functional capability of dilated ureters, J. Sturdivant Read
- From the Department of Urology, Brooklyn Hospital
- f. Suppurative myositis of the psoas iliacus suggesting renal pathology, W. F. McKenna
 - g. Diverticulum of the bladder complicated by carcinoma of cloacal origin, Nathaniel P. Rathbun

III. PAPERS OF THE EVENING

- a. Cytological studies of gonorrhoeal pus, H. L. Wehrbein (by invitation)
- b. Relation between clinical and histological data in prostatic obstruction, W. F. McKenna, James Denton (by invitation)

IV. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, April 19, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

- II. PRESENTATION OF CASES
 - a. Complete dislocation of knee, Edgar W. Weigel (by invitation)
 - b. Unusual congenital malformation of spine, Harold D. Corbusier
- III. PAPERS OF THE EVENING
 - a. Influenzal fascitis, Samuel Kleinberg
 - b. Extra-articular reinforcement for relaxed knee joints, George E. Bennett, Baltimore (by invitation)
- IV. DISCUSSION
- V. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, April 23, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Incarcerated retroversion with pregnancy, Adolph Jacoby
Discussion, Walter T. Dannreuther
 - b. Toxemia of pregnancy with breech presentation and large ovarian cyst, Leon S. Loizeaux (by invitation)
Discussion, Frederic W. Bancroft
- III. PAPER OF THE EVENING
Surgical pathology of peritonitis and puerperal infection, James W. Kennedy (by invitation)
Discussion, Ralph Munson Beach (by invitation), James A. Harrar, George W. Kosmak, Royal C. Van Etten
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION
Nomination of officers and Advisory Committee

Thomas H. Cherry, Chairman
45 East 51st Street

Edwin G. Langrock, Secretary
515 Park Avenue

SECTION OF LARYNOLOGY AND RHINOLOGY

Wednesday Evening, April 24, at 8:00 o'clock

(Please Note Change of Hour)

Manhattan Eye, Ear and Throat Hospital Night

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Carcinoma of larynx, laryngofissure, E. Ross Faulkner
 - b. Myxoma of larynx, Harmon Smith
 - c. Hereditary hemorrhagic telangiectasia

- d. Peri-esophageal abscess following foreign body, J. M. Loré
- e. Sarcoma of arytenoids and epiglottis, V. G. Smith (by invitation)
- f. Adeno-carcinoma of soft palate, J. D. Kelly
- g. Angioma of tonsil and epiglottis, E. C. Kern (by invitation)
- h. Myxomatous sarcoma of nose, G. Allen Robinson
- i. Ozena, 3 cases, L. Hubert
- j. Aneurism of temporal vessels, mistaken for hematoma, C. H. Fornell (by invitation)

III. REPORT OF CASES

- a. Abbreviated report on 7 cases of hemorrhage into fatty capsule of eye, immediately following pan-sinus operation, J. E. Mackenty
 - b. Peritonsillar abscess following introduction of radon seeds for hypertrophied tonsils, Samuel McCullagh
 - c. Exophthalmos due to exophthalmic goiter complicated by frontal sinusitis and orbital abscess, Francis W. White
 - d. Unusual foreign bodies. From the Bronchoscopic Clinic, C. J. Imperatori
 - e. Non-opaque foreign body, right bronchus, multiple abscess, J. M. Loré
 - f. Chronic perichondritis of thyroid cartilage following tonsillectomy, Arthur S. Wilson (by invitation)
 - g. Rheumatic fever following tonsillotomy, recovery after tonsillectomy, R. C. Howard
 - h. Bilateral branchial fistula, 2 cases, J. D. Whitham (by invitation)
 - i. Tuberculosis of tonsil and larynx, H. R. Leshin
- Discussion, George G. Ornstein
- j. Mucocoele of frontal (lantern slides), J. G. Strickler (by invitation)

IV. DEMONSTRATIONS

- a. Home-made instruments, Harry Neivert (by invitation)
- b. An all-metal tonsil syringe, C. H. Fornell (by invitation)

V. PAPER OF THE EVENING

Embryology of the tonsil, Robert H. Fowler

VI. EXECUTIVE SESSION

Nomination of officers and Advisory Committee

FELLOWS ELECTED APRIL 4, 1929

George Henry Fox.....	Binghamton, New York
Morris Aaron Goldberger.....	145 West 86th Street
Robert Gutierrez.....	32 East 65th Street
John Huggins Harris.....	200 West 59th Street
Morris Levine.....	5022—14th Avenue, Brooklyn
Paul Colhoun Morton.....	419 East 57th Street
Samuel Alcott Thompson.....	45 East 62nd Street

DEATHS OF FELLOWS OF THE ACADEMY

GEORGE ALEXANDER MACDONALD, M.D., 803 Madison Avenue, New York City; graduated in medicine from New York University, New York City, in 1878; elected a Fellow of the Academy April 7, 1887; died, April 13, 1929. Dr. Macdonald was a Fellow of the American Medical Association, and a member of the County and State Society.

FRANCIS WISNER MURRAY, M.D., 7 West 43 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1880; elected a Fellow of the Academy April 4, 1889; died, April 12, 1929. Dr. Murray was a Fellow of the American College of Surgeons, a member of the County and State Society, the American Surgical Society, International Surgical Society, French Surgical Society and the Surgical Society. He was a member of the Alumni Association of New York Hospital, Consulting Surgeon to New York, St. Luke's and Goshen Emergency Hospitals, also to the Paul Kimball, Lakewood, St. Francis and Poughkeepsie Hospitals.

RICHARD WALKER BOLLING, M.D., 424 Park Avenue, New York City; graduated in medicine from the University of Virginia, Charlottesville, Virginia, in 1905; elected a Fellow of the Academy November 5, 1914; died April 6, 1929. Dr. Bolling was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Society, the American Surgical Society, the Surgical Society, the Alumni Association of New York and Lying-in Hospitals, Surgeon to St. Luke's and Babies' Hospitals, Consulting Surgeon to Stamford, Flushing, Babies' and Montclair Hospitals.

1929

COMMITTEES OF THE ACADEMY

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FRED P. SOLLEY
ALEXIS V. MOSCHOWITZ
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ROLFE FLOYD
HENRY W. CAVE

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

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No. 6

EDITORIAL

RAMÓN Y CAJAL¹

Among the outstanding figures in modern medicine, there are few whose name and fame have been established with greater unanimity of sentiment than Ramón y Cajal. His is indisputably the greatest name in Spanish medicine, both present and past, yet it was by the oddest turn of fortune that a man of such definite artistic bent came to excel in one of the most abstruse and difficult branches of science, the architectonics and finer anatomy of the central nervous system. His life-work illustrates the close affinity existing between the visualizing talent of the artist and the observational faculty of the physician.

Himself the son of an Arragonese physician at Petilla, Santiago Ramón y Cajal was born on May 1, 1852, just when the scientific trend of modern medicine had been established by Virchow, Helmholtz, Carl Ludwig and Claude Bernard. His father, a capable surgeon, was industrious, enterprising, energetic and conscientious, but through a stern struggle with poverty, a strenuous rise out of the obscure status of barber-surgeon, and the natural desire of well-meaning parents to see their offspring better off than themselves, he made the usual mistake of interfering with his son's development before the lad had really attained to the formative period and taken his stride. The mother, a mountain girl, is described as of

¹ S. Ramón y Cajal: *Recuerdos de mi vida*. 2 v. Madrid, 1907-17. 2 ed. Madrid, 1928. The recent announcement of this autobiography as a new publication, in the literary supplement of The New York Times, is erroneous.

unusual beauty, so much so, in fact, that none of the three sons and two daughters were like her. This prepotency of the male parent made for a certain monotony in the family, even to similarity in mental reactions, a genetic freak for which Cajal avows his utter distaste, since every rational person seeks what is unlike himself, does not like to see his defects duplicated in others, whence, in this case, compensation could only be sought in a different environment. From his father, however, he inherited a strong will to power, "a certain brain and muscle-producing fatality of character," ambition, tenacity of purpose and an extraordinary memory. From the very start, he was obstinate and self-willed, nearly killed in one early experience by the kick of a horse he had annoyed, constantly getting into scrapes and out of them, not unlike the young Osler, in brief, the natural, mischievous boy, as the genial Russian poet, Alexander Pushkin, depicted himself in resilient French verses:

"Vous me demandez mon portrait,
Peint d'après nature;
Mon cher, il sera bientôt fait,
Quoiqu'en miniature.

Je suis un jeune polisson,
Encore dans les classes;
Point sot, je le dis sans façons,
Et sans fades grimaces.

Vrai démon par l'espièglerie,
Vrai singe par sa mine,
Beaucoup et trop d'étourderie
Ma foi! voilà Pouchkine."

Point sot, in effect, so determined was young Cajal to follow his own inclination, so irksome did he find coercion and criticism, that even as a lad, he came to extol the advantages of solitude. His reasoning on this head is worth considering. Even when personal fellowships and friendships are established in the world, he says, solitude is preferable to society, as engendering ideas and permitting their serene development, while "conversation" is usually a monologue maintained on two sides, in which one's

own lines of thought may be interrupted by the verbiage, egotism and personal vivacity of others, to the abasement of intelligence, the weakening of will power and sterilization of effort up to the point of rendering it impossible. Except when deliberately cultivated by *cognoscenti* as a fine art, "there is no conversation." Wisdom lies, not in avoiding activity or society, but in choosing lines of activity and social relations which are conformable to one's ultimate nature. And this self-evident principle Cajal, a great frequenter of clubs, observed throughout his life. A natural bird fancier and ornithologist—for an aviary is a kind of fixture in a Spanish home—he devoted much of his childhood to the collection of birds and birds' eggs. When, later, an artistic bent asserted itself, he found another outlet in wholesale sketching, to the disgust of his over-anxious parent. Three events of his schooldays made a profound impression upon him. A commemoration of Spanish victories in Africa gave him a sense of patriotism and national solidarity, as one way of overleaping the narrow confines of family and small town pettiness, to identify himself with larger social aims. A sudden stroke of lightning during prayers in school, killed the good priest about to ring the bell in an adjoining belfry, knocked senseless the devout schoolmistress, all but capsized his own faith in the workings of a divine providence, confirmed his natural bent to irony and pessimism and left him with an abiding perception of the helplessness of man in the face of the blind, cruel, unjust force which is Nature. On top of this, the eclipse of the sun in 1860, raised the question: Can science predict a happening millions of miles away, yet remain impotent before a stroke of lightning? His education had begun at four, and all this came before the age of eight. Shortly after, his parents moved to Ayerbe, where he found himself assaulted with sticks and stones by the boys in the city square, "through the natural hatred of natives for the stranger or of yokelry for the city-bred, even if a child." With these new boys, however, he was soon in *rapport* and ringleader in such pranks as breaking lamps, robbing orchards and mocking the elderly. He de-

veloped, in fact, a rude science of ballistics and later wrote a small treatise on "lapidary strategy." His talent for drawing revealing itself about this time, he came into definite conflict with his father, whose nature had been warped and embittered by fear of poverty (resulting from his own experiences with overwork and chill penury) and a tendency to *brutaliser la machine*. A malicious painter had observed of young Cajal's drawings: "*El chico será jamás un artista.*"

Thus, determined to make the boy a doctor, the father packed him off to school at Jaca, a kind of Dotheboys Hall, where he was flogged for his stubbornness by a bigoted *padre* and purposely starved to such an extent that, at the end of five months of it, he was brought home "a living skeleton, like a phthisical patient in the last stage of inanition." It is to the credit of Cajal that he takes no meanly-mouthed line about all this. His resentment is as definite and implacable at sixty as at the age of ten and outlined with Latin precision. It is a sad rule of life, he thinks, that sacrifices the bloom and cheerfulness of youth to the musty precepts of a mean old age, and nothing whatever is gained by it. If a natural boy is all volition, like an Indian brave, an inevitable anarchist and communist, despising the weak, how can he get to love knowledge or wisdom any more than men, if the tranquility necessary to acquire it is destroyed by blows and starving? Furthermore, he notes, your smart memorizing boys reveal but a meagre talent for science when put to a real test. Convalescing quickly, his revenge was to construct a wooden cannon, which not only went off but did so much damage to property that he was jailed for three days by the local *alcalde*, at his father's instance, in a filthy cell, where he became intimate with fleas, lice, *Aspergillus niger* and *Blatta orientalis* and again deprived of food, would have starved but for the viands slipped through the bars by a stealthy compassionate lady. He very properly threatened to throw rocks through these bars at people who collected about the jail to gape at his discomfiture. Next year, he was sent to school at Huesca and fared no better.

His father wanted him to become proficient in dead languages, to acquire elegance and amenity, because he himself lacked them, reasoning narrowly that the authority and prestige of the embryo doctor were to derive, not from his science and social gifts, but from a reputation for character and erudition, *i. e.*, from the very things a really efficient physician might dispense with on occasion. The public, Cajal opines, is usually ignorant that talent is in inverse ratio to character, or that solid ability varies inversely with sterile pedantry, so that a doctor in Spain is apt to be judged by his façade and general culture rather than by his actual professional skill. Teachers of boys, he says, should not be oldish pedantic men, tending toward second childhood, but sufficiently young and vigorous to be in sympathy with them and command their respect. Boys of ten to fourteen cannot ordinarily understand languages and mathematics but prefer subjects like astronomy, geography or history. At Huesca, Cajal was bullied and beaten by bigger boys, who incurred his resentment by making fun of his overcoat, and on one occasion, deserted him *en masse*, when he was drowning under the thick ice of a skating pond, from which he extricated himself with difficulty. He was twice chased and beaten by watchmen for stealing roses from gardens, in one case taking refuge in a tree, in the other tumbling into a mud-hole. All this led him to cultivate gymnastics extensively, as a defensive reaction, but his natural propensity to ridicule pedantry again got him into hot water with his schoolmasters and at thirteen he was actually apprenticed in succession to a barber and to sundry shoemakers of the locality. After a year's experience with shoemaking, in which he learned to fashion the daintiest feminine footgear, he was again put to school at Huesca, this time to study "science" and with permission to take lessons in drawing. But he found rhetoric and eloquence more prized than realistic perception of fact, was stupefied by the innumerable philosophical systems and the jargon of psychology, caricatured his professors on a wall with dire results, tried to run away, and was at length taken in hand by his father himself, who

now began to drill him personally in osteology, even taking a hand in robbing ossuaries for this purpose. To these modest lessons on human bones, Cajal attributes his ultimate development into a morphologist. Here his talent for drawing was employed to such good purpose that his father attempted to publish an anatomic atlas of his son's colored sketches, a project frustrated by the backward condition of the graphic arts in Spain. Going up to Zaragoza to complete his medical studies, and where his parent was ultimately established as prosector, he encountered some remarkable medical professors. One of them, holding the chair of pathology, admitted that he knew no chemistry, but advised his students to follow it, as the future key to his science. Another was so old that he sometimes forgot his false teeth, and so found himself inarticulate. This, to his relief, was the signal for a spontaneous exodus of the students. A third, holding the chair of obstetrics, was completely taken in when Cajal jr., in a quiz, gave a brilliant crayon demonstration of the membranes of the embryo at the blackboard, although "a question about foetal presentations or positions would have floored him as an ignoramus."

Some of these men were of superior character but intellectually of more provincial stamp than the medical leaders of the Corte. With Don Manuel Daina, a pupil of Nélaton and Velpeau and incumbent of the chair of anatomy and pathology, Cajal was a prime favorite and, without being particularly brilliant, got his medical degree in 1873. Meanwhile, he had the usual youthful fling at dabbling in poetry, romance and philosophy. By graduation, he was a finished athlete, trying conclusions with school bullies and easily victorious in a fist-fight over a local "Venus de Milo," a young woman of great wealth and of the "cool blonde" temperament, who lived and died indifferent to and unconscious of the turmoil she had created among hot blooded, callow students.

His athletic build, along with his great skill in dissecting, proved helpful to Cajal in passing an examination

for admission to the Medical Corps of the Spanish Army, a step taken in consequence of Castelar's revival of obligatory military service. Resplendent in a "flaming uniform," he was ordered to join his regiment at Burgos, to participate in a campaign against the Carlists at Lerida. After marching and countermarching with his command for eight months, the apparent intention being to annoy the enemy without coming into contact with him, he was promoted to a captaincy and ordered to Cuba. Against the wishes of his father, and under the spell of St. Pierre (*Paul and Virginia*) and Chateaubriand (*Atala*), he sailed in April, 1874, to discover that the primeval forest of his dreams was a fraud—gloomy, dolorous and "uninhabitable by man." There was no *bosqué milenario*, only thickets of scrubby growth; the animal life was mediocre and confined to parrots and colibris. The Cuban he defines as the Andalusian over again, in speech, natural grace, languid *finesse* and "Creole mentality." Ethnic beauty was best preserved in the women, whom he describes as "sweet and suave to a degree unknown in Europe." While he holds it a tactical political blunder to have colonized the island with other stock than the hardy Arragonese and Navarrese of the North, yet he maintains that the white race is non-resistant to the tropics, of which view he (an Arragonese) was presently to have bitter and memorable experience. Neglecting to use his father's letters of recommendation or other push and pull, he was assigned, not to one of the coveted hospital or mobile battalion details, but to an isolated, poorly appointed and unhealthy infirmary of 200 beds, filled with patients, in the thicket at Vista Hermosa, near Puerto Principe, and was soon down with paludism and dysentery. After sticking it out for four months, he was allowed to convalesce in Puerto Principe, with 1½ months service in the local military hospital. The military pharmacist having decamped to the United States with 90,000 pesos in funds, Cajal got his pay but once and had to borrow from his comrades, who raised the amount grudgingly. Being Republican just at the Restoration, when the whole army was Alphonsine, he was not overly influ-

ential and was presently ordered to the hospital at San Isidro, on the military road in the East, which, in his physical condition, proved a worse station than the other. By the spring of 1875, when he got his resignation accepted, Cajal was a very sick man. Improved by the sea voyage and some residence in the North, he returned to Zaragoza, took a medical degree in Madrid, became assistant demonstrator at Zaragoza, where he acquired a micrographic laboratory and eventually the chair in anatomy (1877) and the directorship of the Anatomical Museum (1879). Here his youthful period ends,² and the less eventful course of his scientific career begins. In 1878, he sustained a grave hemoptysis, merging rapidly into pulmonary tuberculosis, which necessitated a long course of outdoor sunlight treatment, instituted by his father (a very good doctor) at the baths of Panticosa and in the pine bosage on the summit of Monte Pano. Yet in 1879, against the advice of everybody, and on a monthly income of 25 duros and a few private fees, he married. His account of this episode illustrates his straightforward simplicity and candor:

"Returning one evening from a walk to Torrero, I encountered a young girl of modest appearance, accompanied by her mother. Her blushing, springlike face suggested Raphael's madonnas, or better still, a German colored engraving of Marguerite in Faust. Attracted no doubt by the sweet, pleasant disposition apparent in her features, her slender figure, her large green eyes veiled by long lashes, her abundant hair, I was even more impressed by the air of childlike innocence and melancholy resignation which emanated from her whole being. Unseen, I followed the young girl to her home, learned that she was the orphaned daughter of a modest employee and enjoyed a reputation for honor, modesty and domestic tastes. I made her acquaintance and after a time, against the collective advice of my family, married her, not without due consideration of the mental characteristics of my fiancée, which were complementary to my own. My resolution was discussed by acquaintances in clubs and cafés as an act of madness: Poor Ramón is lost forever. Good-bye to study, science and generous ambitions. . . . And yet, although eulogies do not flow readily from my pen, I take pleasure in saying that, with beauty which seemed predestined to shine in promenades, visits and receptions, my wife cheerfully

² The engaging boyhood chapters of Cajal's autobiography have been issued in this country as a Spanish reader for students (*La infancia de Ramón y Cajal*, New York, 1925).

condemned herself to the obscurity of my lot, remaining simple in her tastes and with no other aspirations than tranquil contentment, order and system in the management of the home, and the happiness of her husband and children."

In January, 1884, Cajal was called to the chair of anatomy at Valencia, at a monthly salary of 52 duros (3500 pesetas annually). Here the cholera epidemic of 1885 soon drew him into the question of Ferran's vaccines, concerning which he was directed to render a report by the Central Committee. While the first in Spain to establish the causal relation of the Koch (comma) bacillus by a staining method of his own, and to demonstrate the possibility of immunization with dead cultures, his reaction to the Ferran vaccines was negative. Independently of Pfeiffer, he showed that the comma bacillus, while harmless in subcutaneous injections, proves highly toxic to the peritoneum of the guinea pig; but he reasoned that it would be necessary to find a mammal cholerizable *per os* yet capable of resisting intestinal infection through previous subcutaneous vaccination with a pure or attenuated culture. Such an animal, he says was not to be found. Further investigations on degenerative processes in the protoplasm of the comma bacillus, and the gift of a fine Zeiss microscope by the Central Committee, opened out the prospect of fame and fortune in the new and lucrative arena of bacteriology. But economic considerations and an ingrained love of privacy availed to confirm Cajal in his original choice—a career of relative poverty within the restricted terrain of his chosen discipline. In either alternative, his future lay under the microscope. For the world of the infinitely little, he was better visioned and consequently had better luck from the start than most investigators, and here, his artistic skill with pencil and brush, subsequently helped out by the photo-lithographic processes and staining devices of his invention, was to prove a powerful aid, undreamed of by his parent. His earlier investigations in histology, illustrated by himself, fell flat and were first made known to continental Europe by

Krause of Göttingen and by the generous Kölliker (Würzburg), who may be said to have done most for the initial reputations of both Röntgen and Ramón y Cajal.

Through Dr. Luis Simarra, a neuro-psychiatrist of Madrid, Cajal learned the use of Golgi's chrome silver stain (1880-85), an elusive method which he improved by a fixation process and applied to the entire nervous system in a way to incur the lasting intransigence of the Pavian professor. Work on the finer anatomy of the nervous system began with Cajal's transfer to the Barcelona chair (1887) and was at first received with the utmost skepticism. Simarra himself had abandoned the tricky Golgi stain, and eventually wrote to Cajal in 1889 that its results were "more suggestive than demonstrative." In the same year, after a period of great productivity, Cajal went up to Berlin to demonstrate his results to the Anatomische Gesellschaft. Kölliker, Retzius, His, Waldeyer, van Gehuchten, Bardeleben, Schwalbe were all politely skeptical, had indeed got nothing from the new stain but deceptive results amounting to failure, until Cajal, in halting French, demonstrated his slides and showed them how to use it. His results were then confirmed by Kölliker and others. Cajal's reputation was now made, and his transfer to Madrid in 1892 followed as a matter of course. Once domiciled in the Corte, he soon found that arduous investigation was incompatible with the social distractions of a large city, but most of his colleagues being of the same mind (*nadie hacia casa de nadie*), he was able to isolate himself, with only a casual reputation for top-heavy eccentricity. He found solace in promenades about the beautiful environs of Madrid, of which he claims to some extent the discovery, and the clubs. In these, he found pleasant relations, first with the old military comrades of his Cuban period, who soon bored him by continual soreness about pay, promotions and superiors; later with Calleja, Oloriz, San Martín, Letamendi, Gomez Ocaña and other brilliant men of the Madrid Faculty, of whom he gives a series of discriminating pen-portraits. In 1894, Sir Michael Foster invited Cajal to deliver the Croonian Lecture before the Royal

Society of London, where he was stirred with admiration for the magnitude of English scientific institutions. Sadened by the disaster of the Spanish American War, the results of which were foreseen by Sagasta, Moret and Canalejas, he was surprised by an invitation to participate at the decennial celebration at Clark University (three lectures) in the following year (1899). Consenting reluctantly, he had a few negligible experiences with reporters, Fourth of July noises, a secretary who spoiled an irreproachable frock-coat by hoisting the Cajal baggage (90 kilos) into a conveyance, under the pretext that "in democracy" such solemn nonsense constituted the duty "not of servants but of every citizen"; and a host who told Cajal that "only Spanish women were talented and he himself the only living Spaniard endowed with common sense"; but, apart from a few other specimens of post-bellum asininity and bumptiousness, he was very agreeably impressed. At this time, Cajal was a handsome figure, with the abstracted mien of a laboratory worker, in the prime of life and of international reputation. In 1900, he was awarded the "Moscow Prize" at the International Medical Congress (Paris), and had already gained the Rubio, Fauvelle and Martinez Molina prizes. In 1903, his *Laboratorio de investigaciones biologicas*, authorized by the Cortes in 1901 and now known as the Instituto Cajal was completed. He received the Helmholtz medal of the Royal Prussian Academy (1904) and, in 1906, was summoned to Stockholm to receive the Nobel Prize, conjointly with Golgi. This event was spoiled for Cajal by the pompous and tedious self-reference of his fellow-prizeman, who, impressive with Victor Emmanuel moustaches, took all the credit to himself for the neuron theory and the finer anatomy of the nerve-centres, to the consternation of the courteous Retzius and other eminent colleagues. In the same year, Moret offered Cajal the Ministry of Public Instruction, which he very wisely declined. In 1913-14, he crowned his scientific career by the publication of his great work on degeneration and regeneration of the nervous system, printed at the expense of Spanish physicians in Argentina, and reissued

by the Oxford University Press in English translation in 1928. His laboratory became known as the Instituto Cajal upon his retirement in 1922.

The scientific achievement of Cajal is impressive, both as to quality and quantity. From the *Spieltrieb* of the natural, careless boy, "sure of his dinner," there evolved, as in Osler's case, a man of prodigious industry, whose main object in middle life was to economize time for the prosecution of work in his chosen field. At the start, Cajal noted that nearly every finding in histology is incomplete, a mere first stage, needing further development and elucidation, so that much of his work has been of detailed character, often concerned with improvement or confutation of the findings of others. Hence he was frequently enmeshed in controversy and, doubtless in consequence of neglect resulting from the barrier of language, has been overly meticulous in setting forth the minutiae of his labors. A proper perspective of the woods is sometimes difficult to obtain from proximity of the trees, for in neurological histology, things frankly negligible on the broad current of medicine become of portentous significance. The second volume of his memoirs (1917), a stout, heavy volume of 615 pages, is mainly taken up with these complex details. Estimate of the extent and magnitude of Cajal's achievement may perhaps be sensed from the following chronological tabulation, condensed from his own "telegraphic" summaries:

- 1880. Investigations on the genesis of inflammation.
- 1881. On the nerve endings of voluntary muscle in the frog.
- 1885. On the comma bacillus of cholera.
On involutional and monster forms of the cholera bacillus.
- 1886. Study of anastomosing cells of stratified pavement epithelium.
- 1887. Histology and staining of the cortex of bone.
Texture of mammalian muscle fibre.
Muscles of the paws of insects.
Plasmatic conduits in hyaline cartilage.
- 1888. Texture of muscle fibres of paws and wings of insects.
Improvement of Golgi stain.
Discovery of the varied forms of terminal and collateral ramifications of the axis cylinder, their contact with the nerve cells and

dendrites, the rôle of the soma and offshoots of nerve cells as conducting chains, and the conduction of nervous impulse by contact or induction.

1889. Publishes *Manual of Histology and Micrographic Technics*. 6 ed. 1914.
- 1889-90. Studies on the histology of the spinal cord; description of the collaterals of white substance, the formation of commissure-fibres, classification of the neurons of the gray matter; T and V-shaped forkings in ascending and descending fibres of the two lateral columns; existence of innumerable small neurons in the Rolandic substance; the terminal *anlage* of sensory roots in birds and mammals; confirmation of views of His on the origin of the posterior roots from sensory ganglia; structure of the visual lobules of birds.
1890. *Manual of Pathological Anatomy*. 5 ed. 1913.
 Studies in neurogeny (embryology of neurons and nerves, cells and fibres of the cerebellar cortex, including metamorphoses in Purkinje and granule cells).
 Discovery of network of nerve-cells around fascicles of striated muscle in insects.
 Sympathetic nerve-endings in heart of reptiles and batrachians; minutiae in histology of cerebral cortex and olfactory bulb.
 Controversy with Golgi as to discovery of collateral fibres in spinal cord (1880).
1891. Pyramidal ("psychic") cells in cerebral cortex of reptiles, birds and mammals.
 Minutiae in histology of neurons in brain, terminal sympathetic fibres, and retina.
 Theory of dynamic polarisation of neurons (transmission of nerve impulse from receptor (soma and prolongations) *via* axon to distributor (end ramifications); modified 1897, as Theory of Axopetal Polarization).
 Popular lectures on structure of nervous system at Barcelona. (French translation by Mathias Duval, 1894.)
1892. Monograph on retina of vertebrates (*La Cellule*, ix. no. 1; German translation by Richard Greeff, 1894).
- 1892-3. Structure of horn of Ammon. (Translation by Kölliker, 1893.)
1893. Histology of intestinal sympathetic.
1894. Croonian lecture on finer anatomy of nerve centers. (Royal Society of London).
- 1894-6. Histology of pons Varolii, hypophysis, auditory nerve, corpus striatum.
1896. New structural findings in retina.
 Structure of epithelial tumors (use of triple stain).
 New findings in central nervous system; morphology of nerve-cell and neuroglia.

1897. Theory of Axopetal Polarization of Neuron (1891).
Publishes Elements of Histology. 7 ed. 1921.
Discourse on *Rules and Wrinkles in Biological Investigation*.
Speculations on histologic mechanism of association, ideation and attention, (avalanche transmission of peripheral sensation from dendrites to nerve centres).
Dynamics of neuron. (Economy of space, matter and time in transmission of impulse).
Starts *Revista trimestral micrográfica*.
- 1897-1904. Publishes 3 volume treatise on *Texture of the Nervous System*.
(French translation by L. Azoulay, 1909-11.)
1898. Structure of optic chiasm; general theory of decussation.
1899. Three lectures on cerebral cortex at Clark University.
- 1899-1900. Structure of Flechsig projection (perceptive) centers, visual, auditory and olfactory centers, island of Reil (histologic mechanism of localisation of function). (German translation by J. Bresler, 1900).
1900. Appointed director of Instituto nacional de higiene de Alfonso XIII (Madrid).
- 1900-01. Histology of auditory and cochlear nerves, thalamus, olfactory centre, nucleus of corpora quadrigemina.
- 1902-03. Structure of septum lucidum, thalamus, cerebellum.
1903. Acquires Laboratorio de investigaciones biologicas (Instituto Cajal).
Revista trimestral micrographia becomes *Trabajos del Laboratorio de investigaciones biologicas*.
New method of staining nerve cells and fibres (silver nitrate and pyrogallie acid), structure of neurofibrillae; Golgi reticulum; embryology of cerebral nerves, spinal ganglia, motor end-plates, etc.
1905. Histology of sensory and sympathetic ganglia in man and mammals (use of modified silver stain).
- 1905-6. Mechanism of regeneration. Origin of nerve-fibres and neuron.
1907. Controversies with Held (neuroblasts) and Apathy (neurofibrillar continuity).
- 1908-9. Comparative histology of cerebellum, medulla, auditory ganglia; origins and endings of sensory and motor nerves.
- 1910-12. Degeneration and regeneration of neurons and axons of central nervous system; non-regenerability of central paths; structure nucleus of nerve-cells; autolysis and extravitral culture of neurons; neurotropic; transplantation of nerves and ganglia; staining of blood platelets.
1912. Treatise on Colored Photography.
- 1912-13. Staining of Golgi reticulum with uranium nitrate.

1913. Studies of neuroglia with new gold-sublimate (elective) stain: "third element" of the central nervous system (small bodies around neurons without dendrites).
- 1913-14. Monograph on *Degeneration and Regeneration of the Nervous System* (English translation, 1928).
1915. *Anlage* of retina in insects (pathways of transmission of nerve-impulse).
1916. Gold-sublimate stain for neuroglia (1913): improvement of technique.
1917. Retina and visual centers of Cephalopoda.
1918. Stereoscopic and bi-planar photomicrography of nerve-tissue. Structure of ocelli and their nerves in insects. *Technical Manual of Pathological Anatomy* (with Tello).
1920. Modification of Bielschowsky method of staining neuroglia and mesoglia; "third element" described as "dwarf satellites" of neurons; mesoglia cells of cerebellum.
1921. Method of silver impregnation for cerebellar sections; visual cortex of cat; studies of sensation in ants.
1922. Typical finer anatomy of regional cortex of rodents (1893). Retirement. Foundation of Instituto Cajal.

It was the youthful ambition of Cajal to found no less than a school of Spanish histologists, at that time seemingly the most Quixotic project ever entertained in the medical history of his nation. Yet he succeeded magnificently. His pupils include such men as the eminent neuropsychiatrist Nicolas Achucarro (1851-1918), who worked on the neuroglia and devised a new stain for connective tissues generally, Pio del Rio Hortega, who discovered the microglia and oligodendria cells (1919), and Francisco Tello, who succeeded Cajal in the Madrid chair of histology and is remarkable for his investigations of the neurofibrillae, transplantation of cerebral nerves, development and regeneration of nerve endings. Among the more recent men, de Castro (neuroglia, sympathetic ganglia), Villaverde (neuropathology), Sanchez (comparative neurohistology) and Llorente de Nó (auditory and vestibular nerves), have already made their mark. Cajal himself will always be memorable as the prime mover of improved staining methods which enabled him to elucidate the minute details of the finer anatomy of all parts of the nervous system on a scale never before realized. His actual con-

tribution is the ultimate developmental and structural basis of the dynamics of the neuron, of transmission of impulse, of localization of function, of degeneration and regeneration of the neurons and axons of the nerve-centers. His great memoir on the histology of the retina (1892), completes and supplements the pioneer investigation of Max Schultze (1866). His encyclopedic treatises on neuro-histology (1897-1904) and on degeneration and regeneration in the nervous system (1913-14) are his masterpieces. The tendency of the latter is confirmation of the Wallerian law of degeneration (continuity of neuroblastic and primary axones) all along the line. Few have better realized the very human tendency of scientific men to flock, in warlike array, to the standards of their respective nations, their chosen leaders or pet hypotheses on occasion, and the equally human tendency of leaders to demand unquestioned fealty of their vassals, even to the extent of suppressing data which do not square with their theories, lest a beautiful hypothesis be slain by a nasty, incontrovertible little fact. Cajal has shown a rare and noble gratitude toward the men who first made his European reputation possible by confirming his results, and like Charcot, he has not only reciprocated handsomely but has been more conscientious than most in according due credit to the work of foreign investigators. His footnote references and bibliographies are complete, scholarly and accurate. At Stockholm, in contrast with Golgi, he enlarged, with generous profusion, upon the work of the men who had initiated, confirmed and supplemented his own endeavors. The life-long intransigence of Golgi, puzzled him, in fact, and the entry of the two as *primi inter pares*, with reference to the Nobel Prize, was perhaps an unintentional tactical blunder. To "solder incompatibles and make them kiss" is a favorite humorous device of organized social and scientific meetings, where the impersonal aims of science might be better attained by the ordinary pharmaceutical plan of keeping them apart. On such occasions, a Lobachevskian devil's advocate has been known

to mutter: "Cursed are the peacemakers, for theirs is the kingdom of Dis and discord, the hotbed of future wars."

There was in Cajal the making of a philosopher as well as of the artist and the anatomist, as shown by his boyhood reactions to important happenings in his life. His purely literary performances include his autobiography (1901-17), some "pseudo-scientific" vacation stories (1905), a discourse on the centenary of the publication of Don Quixote (1905) and *Charlas de Café*, a string of anecdotes, aphorisms and philosophical observations, sombre in tendency, but some of them finished works of art, suggesting Chamfort, Stendhal, Schopenhauer, Nietzsche and the other masters of tabloid cynicism. The Autobiography is of unequal merit, eminently readable in the first volume, unwieldy and unmanageable in the second, by reason of the portentous inclusion of scientific material. The utterances are those of a terrible truth-teller, downright, forthright, from the shoulder, "uncompromising as justice," yet imbued with that fine Latin quality of good taste, which instinctively evades crudity as well as cant. Aside from the trite observation that old age begins with decline of the generative powers, little is said about the sexual, nor is any extravagant line taken with reference to politics or religion. The author is concerned mainly with the personal merits and failings of the featherless biped which is man. A liberal in politics, yet rendering unto Caesar that which is Caesar's, Cajal has perhaps reflected more credit and honor upon his country than any other man save Cervantes or Velasquez or Calderon Barca; his criticisms of its shortcomings are tempered with the sadness of comprehending sympathy. Spain, he says, has art and letters but no science. In his view, Spain was ruined, not by punctilios about "honor," but by the overweening ambitions of the House of Austria, which, using religion as a stalking horse, squandered blood and money on false dynastic interests which concerned Spaniards not at all. Here the analogy with the baleful reputation acquired by Prussia and Russia from the same trend is strong, yet with all due censure of the men higher up, some blame must be

accorded to participants lower down, and in the Autobiography, one senses the curious contrasts of *bonhomie* and barbarity in Spanish character which are in all races and nations. Cajal himself combines the expansive idealism of Calderon with the mundane irony of Gracian or Quevedo Villegas—a prose Shelley with a touch of Chamfort.

Says George Brandes: "The great pessimistic Latin writers, such as Flaubert or Leopardi, are stylists in harsh, firm outlines: German sadness is glaringly humorous or pathetic or sentimental; the melancholy of the Slavs springs from their weakness and sorrow, coming in a direct line from the sadness of the Slavic popular ballads." The sentences from *Charlas de Café* translated below must be judged from some such angle. The observation of life is as direct, mordant and uncompromising as that of Dante or Chamfort or Tirso de Molina. All is suffused with the Latin pessimism, but there is about Cajal the comprehending vision and compassion of the greater physicians and a grace of expression which bespeaks the natural artist. Not every aphorism is as successful as the "*El mundo es poco*" of Columbus or those sentences of La Rochefoucauld which are greater individual contributions to literature than the same number of stodgy volumes by duller men; but here, as "mere literature," we have Ramón y Cajal at his best; here he attains to what Renan styles, the highest gift of man, "the art of being essentially impersonal," bidding us farewell with the gesture of the noble Spanish poet—

"Así, Cipriano, son
Todas las glorias de ese mundo."

SENTENCES FROM CHARLAS DE CAFÉ

(Translated by F. H. Garrison and printed by kind permission of the distinguished author.)

The most effective and economical of all reactions to injury is silence.

Never become intimate with the friends of your enemies; they are spies, reporting upon your errors and defects.

The ingrate, who deserts us after a benefit received, is preferable to the kind of gratitude that buttonholes us for all tribulations thereafter.

It is best to attenuate the virulence of our adversaries with the chloroform of courtesy and flattery, much as bacteriologists disarm a pathogen by converting it into a vaccine.

If you wish to be independent, admit no one outside your family to the familiarity which tyrants display to their vassals.

To pardon the first grave deception in children, servants or friends is to be victimized by the last one.

The joviality of friends is the best antidote for the venom of the world and the fatigues of life. In the words of the old song: "He loves me who makes me laugh."

Man is an illogical animal, whose reactions correspond less with his sentiments than with his interests.

There are painful and implacable hatreds which have no other origin than a certain distraction upon being spoken to or one's forgetfulness to acknowledge a card.

A. I see that you are good friends. B. Not exactly; we are useful to each other.

Beauty is a letter of credit signed by God and often directed into false channels by the Devil.

Nature offered women chastity to make them strong and sane.

A beautiful woman is always preferable to an eccentric one.

The assimilation of women to the masculine physique and mentality will, I fear, convert the angel of the hearth into an antipathetic virago, while love will transform itself into an onerous public duty to produce laborers and soldiers.

In Northern countries, manly beauty is usually superior to the feminine, by contrast with the feminine superiority of the South.

How many lovers and husbands are now devoured by their loved ones!

Matrimony out of compassion is the most refined mode of egotism.

All matrimonial shipwrecks come from the fact that the wife did not select but was selected.

In youth we say: "I am immortal." In age, we say: "I die without having lived." And it would be the same if we lived the three hundred years of the crocodile or the two hundred of the elephant.

Gray matter abounds in countries with gray skies.

Like the cordilleras, which seem more distant on cloudy days than in clear sunshine, certain minds envelop themselves in clouds to seem profound.

Genius, like the inhabitants of the depths of the sea, moves by its own light.

Truth is a corrosive acid which is sure to bespatter him who handles it.

It is difficult to be a friend to one's friends without being an enemy of justice.

Take care when an adversary does you justice in public; in that case, you need it.

People are neither good nor bad but spiritless, distracted, lazy and generally tardy or forgetful of duty.

The highest happiness almost always coincides with forgetfulness of ourselves and of others. This beatific alienation of frivolous or disagreeable things is attained when we ask our servant: Have I eaten?—an unequivocal criterion of vocation.

Every gratuitous burden of responsibility is essentially immoral.

A woman venerates her parents, esteems her husband but adores only her sons.

Aristocracies are like the lighter and more tenuous gases of the higher atmosphere, of invincible inertia and incapable of combining with active, useful elements.

When I clapped for the waiter in a café, it was greeted by the wretched pianist as applause.

The increase of unpunished crimes goes to show that men are good or mediocre from apathy, lassitude or inconstancy and that laws appear to have been dictated *ex profeso* against those who ignore them.

We disdain and hate from lack of self-comprehension and we understand in proportion as we study ourselves.

Try to honor your children lest they dishonor you.

Civilization, like life itself, arose on the seashore.

Injustice would not be so fearful were it not more audacious and diligent than justice. The first collects, the other pays.

At the bottom of the anxiety for immortality lies the frantic desire to get away from the world and from ourselves.

Vitalists are like the Chinese, who maintained that Prince Borghese's automobile was propelled by a horse inside.

Truth is as modest and obdurate as an honest woman, who might give herself to a well bred, youthful lover but never to a clique of conceited old goats.

Those who have not been a little wild in youth are in danger of being so in age, excepting always the mentally defective, the weak-willed and the prematurely old.

Rhetorical emphasis, like the florid, polychrome Manila shawl, does not favor beauty but italicizes vulgarity.

Do you wish to be invisible to men? Be poor. To women? Be old.

To the heroic virgins who marry old goats, the X-rays disclose only skeletons, purses and diamonds, which they view without dismay as harbingers of a succulent and diverting widowhood.

Towers of ivory may become lonely towers of silence.

The *homo homini lupus* of Hobbes is a libel on Br'er Wolf,³ who kills

³ "Brother Wolf" is the expression both of St. Francis of Assisi and of Uncle Remus.

only to satisfy his hunger and does not formulate cynical theories to justify his crimes.

To be right before the right time is heresy which is sometimes paid for by martyrdom.

If business is "other people's money," then power and happiness are other people's misery.

In the future, children will be for the poor a resource, for the plutocrat a mode of ostentation, for the bureaucrat and small rentist a sacrifice.

The greatest tonics for will-power are truth and justice.

The greatest friends of Spain are those who have justly shown us the defects which go with our good qualities.

The weak succumb, not from weakness, but from ignoring that they are weak. It is the same with nations.

Physical pain is easily forgotten but a moral chagrin lasts indefinitely.

Libraries are successively the cradles and the sepulchres of the human mind.

The human brain is a world consisting of a number of explored continents and great stretches of unknown territory. Its vast potentialities are ignored and unsuspected by the commoner run of laymen. The cultivated man tries to discover its occult treasures.

Let the vicious and idle say what they choose, agreeable and useful work remains the best of distractions.

The ideal of science is to elucidate the dark mysteries and unknown forces which invest us, for the benefit of our descendants and to make the world more agreeable and intelligible, while we ourselves are forgotten, like the seed in the furrow.

Our period differs from other epochs in an exaggerated triumph of the practical, in the production of good laborers but poor directors.

Let us follow the wise in all humility that we may some day march in company with them or even ahead of them.

Nothing is so distracting to old men as to occupy themselves with history, in other words, with the lives and deeds of men more antique than themselves.

The desire for fame is of two kinds: to seek it as an end or to use it as a means.

In spite of the efficiency of modern medicine, our intellectual or intelligent people do not live as long as in antiquity.

The saddest thing about old age is that its future is behind it.

Like an earthquake, true senility announces itself by trembling and stammering.

It is notorious that the desire to live increases as life itself shortens.

A mature fat man excites pity, like a ship well stocked for its last voyage.

Since time slays us, our young people aim to kill time, not knowing the invincible nature of Chronos.

If death were like the consoling dreamless sleep depicted by ancient philosophers, we should desire it. But Freud has shown that sleep is a theatre of far more disconcerting action.

You amount to very little if your death is not desired by many persons. How many sages, philosophers and even vulgar people have the pretence of dying like heroes, when they really die like actors!

In the pomp of a funeral, the only beings who seem to appreciate the solemnity of the occasion, and to abstain from gossiping about the defunct, are the horses.

ADDITIONAL SENTENCES FROM CHARLAS DE CAFÉ

(Translated by Col. George Blakely, U. S. Army (Ret.), San Francisco.)
Blessed are they who can say no, for they shall live in peace.

Let us treasure those judicious friends who know how to take the refusal of an unjustified claim.

Few bonds of friendship are so strong that they cannot be severed by a woman's hair.

Friendship dislikes poverty as the flower darkness. Therefore, if you would keep your friends, conceal your wants and troubles.

A person is not your friend who writes to you through a secretary, or, granting you an interview, passes it off with vulgarities and commonplaces. On the contrary, he esteems you who, in conversing with you, frames a happy remark, makes a timely observation, or gives you some good advice.

The man of culture would be lost in the blue, if the woman, like the ballast and cord of a captive balloon, did not prudently draw him back to earth.

Reality overruns every concise phrase, like liquid poured into a tiny cup. As long as our brain is a mystery, the universe, the reflection of the structure of the brain, will also be a mystery.

Many times I have wondered if evil is not put into the world as a motive for work and an incentive to our curiosity.

Described by the monkey, what would man be? Probably a sad case of degeneration, characterized by a contagious mania for talking and thinking.

Never could I understand how certain religious communities offer to God, by way of expiatory mortification, the brutifying action of silence. This is equivalent to abdicating our dignity as men, since the only essential feature which distinguishes us from the animals is the precious gift of articulate speech.

In conversation, let us check the insane temptation to scatter jokes at the expense of our friends. As Gracian said, "Put up with jests, but do not make them." In unsheathing its unvenomed sting, the bee usually gives itself a mortal wound. There is no greater enemy of an intellectual nature than ill-nature.

That which enters the mind through reason can be corrected. That which is admitted through faith, hardly ever.

It is idle to dispute with old men. Their opinions, like their cranial sutures, are ossified. Nothing inspires me with more astonishment and veneration than an old man who can change his opinions. It is only while the brain is growing that doctrines can be inculcated and errors corrected.

Let us look on men with systematized minds as on books; they are read if interesting, but no one argues with them.

To reason and convince—how difficult, long, and laborious! Suggestion—how easy, quick, and cheap!

Let us never argue with fanatics. For we are not contending with a man but with a formidable army, whose invisible soldiers, posted as a rear guard in space and time, cannot hear us.

Back of our opponent stand those who shaped his brain and his ideas, that is to say, his parents, his teachers, his friends, the social caste he belongs to, and in short the innumerable train of illustrious dead who are set against us by his dogmatic pride, his errors, and his interests.

Seldom indeed do we find confirmation of the common maxim: "from discussion issues *light*." What often issues is the *fire* of exasperated pride, *smoke* that obscures the clearest problems, and the *ashes* of disillusion. So, at the end, the contestants are rather burnt out than illuminated.

Only the doctor and the dramatist enjoy the rare privilege of charging us for the annoyance they give us.

A great dose of indulgence is required for affection to subsist. Let us deal with men as the alienist deals with his patients; to their manias and aggressions he always opposes a soothing charity and understanding.

Extravagances! Gross illusions! Who is free from them? The fact is, the peculiarities and follies of the superior man attract attention, while those of the insignificant man pass unnoticed by anyone.

Mediocre men, perhaps to console themselves, often ridicule the man of genius for extravagances and even for lunacies.

In general, sincere opinions are expressed only in small and intimate circles. With a theatre and gallery, we are all, to some extent, play-actors.

Besides other inconveniences, much talking has the very serious drawback of preventing an intimate acquaintance with the people with whom we converse. Our loose flow of words converts them into listening enigmas. The tyrants of monologue unconsciously prepare for themselves great and unpleasant surprises.

Zoology is often very instructive. It is well known how extraordinary is the longevity of the crocodile and the elephant, animals of thick and almost impenetrable hide. From this we may infer that to attain long life, we should sheathe our spiritual skin, making it insensible to the pin-pricks of rivals, of enemies and of the envious.

Glory is nothing more than oblivion postponed.

No one has expressed more vigorously and eloquently his contempt for glory, than Tolstoi (see his intimate diary), and yet the great Slavic writer spent his life in writing novels, that is to say, in courting with solicitude the applause of his contemporaries and of posterity.

Only those men merit glory who by intelligent and unselfish action embellish, improve, and enlighten the world we live in.

Small inward treasure does he possess who, to feel alive, needs every hour the tumult of the street, the emotion of the theatre and the small-talk of society. Hence the urgency of adorning the abode of the spirit carefully and betimes. Then, if the world rejects or wearies us, we may build a dream-castle within ourselves.

Grandmontaigne writes that he knew a German naturalist who undertook a voyage to Brazil to hunt a butterfly. I met a scientist in New York—Doctor Forel—who went to America solely to study an ant. Happy the nations in which men are born who risk their ease and even their lives—a glorious and noble life—to examine a lowly form of life far away.

The best book is just that which circumstances and social environment prevent being written. What an admirable and most original library our country would possess, in philosophy as well as in literature, could it gather the books our classic talent, and even our contemporaneous talent, did not dare launch into publicity!

I hold it probable that one of the reasons (there are many) why the mind of certain animal species has remained stationary lies in the ignorance of death, or in having but a confused and crepuscular consciousness of it. Emerging precociously in primitive man, the terror of non-existence has been the major instrument of his progress. It has fashioned the hand and complicated the brain, and has produced those admirable tools of defense, of exploration, and of work, which, according to Bergson, are the characteristics of rationality.

Schopenhauer says: "The old man walks about tremulously or reposes in a corner, being but the shadow or ghost of his former self. When death comes, what remains but to die?"

Much remains—a brain tenaciously grappling with its functions of thinking, although it feels itself blocked by weak and failing organs. And the brain is the whole man.

A certain philosopher affirmed that with man's death "all is reduced to a broken mirror." Taken altogether, the most deplorable thing is not the fracture of the mirror but its rapid deterioration when it has hardly arrived at reflecting but an insignificant phenomenal sector of the Cosmos. From the height of eternity, human heads must seem to the psychological Principle of the Universe like those bubbles of foam formed by the wave that breaks along the shore. They glisten for a moment with polychromic light, reproduce in miniature the azure of the sky and the magic of the landscape, then in an instant burst, giving way to a new generation of iridescent globules.

I was always inclined to look on dancing as a kind of grotesque gymnastics, with no more purpose than to facilitate the circulation of the blood and to develop the lungs, or else as a provocative game left over from barbarous ages, calculated to awaken the sensuality of the man deadened by the fatigues of labor.

To-day, I think that every habit refractory to the action of time must possess some positive advantage for the species. So I have ended by correcting my old opinion.

Two classes of beauty are universally recognized—the static and the dynamic. At receptions and in the theater, the marriageable girl exhibits by preference her statuesque beauty, interpreted by line and color. But only when she dances does she reveal fully her dynamic beauty, that is to say, grace, agility, and easy carriage. With face aglow and eyes sparkling with emotion, every dancing maiden seems to be telling her partner: "Look at me; I am more than a beautiful statue; I have also the sense of rhythm and music. My lungs are tireless, my joints supple and firm, and in my breast beats a heart proof against fatigue and emotions. Take me, for I am sound and strong; I am not intimidated, rather am I imperiously attracted by the pains and sacrifices of motherhood."

I wonder at the intrepid and sublime unconsciousness with which woman pursues matrimony, where often await her, along with maternal anxiety, disillusion of love, physical ugliness, and not infrequently infirmity and premature death.

"All inclines towards death," is affirmed by Hartman and Mayland. Science teaches that the world tends to lose its differences of potential. Entropy (Clausius), ever-increasing, will put an end to all phenomena, including of course vital phenomena. If such is the destiny of life, I understand cosmic suicide and I find natural and almost desirable the shock of the dark star, which, as Arrhenius predicts, will return our poor old planet to its primordial nebulous state. With mortal anguish I call to mind the disconsolate *Debemur morti nos nostraque* of Horace. To what end should we labor?

Thus caviling I look out of the window. It is Sunday in Madrid. A torrent of jocund life is pouring through the street, branching into a thousand winding rivulets. Handsome women are on their way to the theater; young sales-clerks are storming the coaches for the Bull Ring; countless couples and families crowd together, eagerly awaiting the street-cars of La Bombilla, of La Moncloa, or of Los Cuatros Caminos. And in the presence of this unconquerable optimism of life I react. Let us obey its mandates. To display such optimism, must not life have reasons unknown to the philosopher and the scientist?

The law of compensating counteraction holds for peoples as well as for individuals. Docile and disciplined Germany has ever been the cradle of great religious, philosophical, and political revolutions; while Spain, a ferociously individualistic and undisciplined nation, has been a never-

with the American Indian both of history and even of recent days has caused me to grow in my admiration and respect for the first American and to view his ideals and purposes with a very sympathetic appreciation. I say this because if I err in my statements regarding him and his customs it is because of this attitude and not because I presume to discuss him from the point of a superiority complex.

Few of us are aware, perhaps, unless we have particularly studied the subject how the ideals, customs of life and even the personal habits of the Red Man have influenced and developed those traits of our own people which we most proudly speak of as American. Our geography, from Massachusetts to the Willamette, is expressed mostly in its Indian names. Our great railway systems follow the moccasin broken trails. Our speech and our idioms, more especially our Americanisms, abound in the dramatic and poetic conceptions or vernacular of the Red Man. For instance, we "hit the trail;" we do not die but "pass over the divide;" we "dig up the hatchet;" we "smoke the pipe of peace;" each I hasten to say on their appropriate occasions, and most of us hope in the end for "the happy hunting grounds." The camp fire and the lodge circle are terms which rouse in us the strongest of domestic, community and friendly ties. If there be one trait or ideal which we boast and emulate more than another it is that of independence; liberty to us is something more than a name, it is a religion and an inspiration, it is a fighting word. It has been the one greatest trait and pride of our red progenitors. The Red Man never has been, nor will he ever be a successful slave, as were at times the Greeks, the Romans, the Britons and the Teutons. The high tide of attempts at Indian slavery culminated in La Noche Trieste. Tecumseh, Geronimo, Joseph and Sitting Bull are our heroes as they were theirs. The Red Man has never been too proud to fight, for he has always been too proud and too ready a fighter to be a slave.

The Honorable Cadwallader Cobden, Esq., one of His Majesty's Counsel and Surveyor General of the Province of New York (about 1727) wrote, "We are fond of researching into the remote antiquity, to know the manners of our earliest progenitors; and if I am not mistaken, the Indians are living images of them." He further writes (Introduction par. 5) : "The Five Nations are a poor and generally called, barbarous people, bred under the darkest ignorance; and yet a bright and noble genius shines through these black clouds. None of the greatest Roman heroes have discovered a greater love to their Country, or a greater contempt of death, than these people called Barbarians have done, when Liberty came in competition. Indeed, I think that our Indians have outdone the Romans in this particular; since some of the greatest of those we have known murdered themselves to avoid shame or torments; but our Indians have refused to die meanly, or with but little pain, when they thought their Country's honor would be at stake by it."

Cobden was one of New York's earliest, greatest and most learned Governors. After reading his charming and graphic essays, I have always liked to think that his keen power of analysis, his wonderful knowledge and power of command, and his appreciation of the Indian are largely due to his early desertion of theology and his study and preparation for the practice of medicine.

It must be obvious to the most simple that a people as strongly characteristic and great as the Indian has been must have had a system of medicine in some way comparable and suitable to its type.

It must first be remembered in this respect that comparisons with our present views of medical science are hardly fair or true. It is highly improbable that even to-day the medical customs of our best University would be particularly well adapted to the needs of the Esquimau or of the primitive African. It requires to-day much more than mere professional knowledge and training for a medical missionary to make himself useful among primitive

peoples. Most of them fail because they are not intelligent enough to appreciate social environments and requirements and the mental processes of a strange but not necessarily inferior race. We must recall that the Red Indian of Columbus or Frontenac, even he of the time of Lewis and Clarke, while undoubtedly then at his high pinnacle of development, before his contamination and degradation through the mingling of species as Madison Grant puts it, was in truth at this time but a man of the Stone Age for the greater part. The greatest of the traits of the Indian of Sheridan and Custer was but a persistence of these types and traits. Still I do not fear the comparison of Indian medical lore and customs with those of our white ancestors of these same periods of development or even to a certain extent, with those of the same date as exemplified among the pioneers. We must especially bear in mind that the demands of the Indian practice at these times were very different from those of our own race. Even to-day the real medical needs of the larger Indian groups, as the Navahoe or Ojibway are very different than those of the whites because of a different environment, variant social customs and actually a different type of disease occurrence to a considerable degree.

Back as far as history and tradition go, back even as far as Indian archeology extends, we know that the Medicine man has always held a position in the tribe and in its social standards far more powerful and important relatively than the white medicine man has yet attained. Many of the great Indians in history have been Medicine men. Tecumseh, Joseph, Geronimo, Sitting Bull are names familiar to us all. When in times not so distant in history the white practitioner of medicine held a position but little above that of a servant class, the red practitioner held the chief place in the council circle. No war was ever waged except on his advice or consent and in many instances the medicine man was also war chief as was the case with Sitting Bull.

Among the missionary writings much has been and still is stated as to the great hindrance to their work exerted

by the Medicine Man. They have persistently intimated that his opposition has emanated because of the excellent revenue which was obtained from his practice. Precisely identical arguments are urged against us by the Osteopaths, Chiropractors, Christian Scientists and the like and probably with equal justification.

The Indian has ever been a man willing to express appreciation in values and also to respect a learning apparently greater than his own, hence he paid his practitioner well and honored him much.

As a first example of the open-mindedness and of the wisdom of the Indian, one must point out primarily that the medicine man was by no means always a man, for in nearly all the better tribes, notably among such a splendid people as the Ojibways were and are, women were accepted as practitioners (Mary Bear, Mrs. Steve L'Africain).

In nearly all instances the medicine man was not an hereditary office, though quite naturally, as often with us, the sons or daughters of successful practitioners aspired to the parental dignity. Medicine Men were elected, appointed or through their ability and skill, real or assumed, found their own recognition. Among certain tribes, notably the Ojibway, the dignity was a graded one, dependent on various courses of study, some extending over many years and in which fitness to practice was determined, as with us, by examining boards.

Lieutenant Bourke (*Medicine-men of the Apache*, p. 457) states, however, that among certain of the Cherokee, the custom is preserved of consecrating a family of their tribe to the priesthood "as the family of Levi was consecrated among the Jews."

Among the present day Hopi, and also to a lesser degree among the Navahoes young boys are dedicated, perhaps before their birth to a medicine clan. At an early age they go to live with the elders of that clan in the kiva, and here they receive years of training in the dances, mysteries and ceremonies of their calling. The use of

herbs, the reduction of fractures, what you and I consider as the strictly medical branches of their training are by no means neglected though unfortunately most is made of the ceremonies and mysteries of their faith. That is, the theological dominates over the strictly medical to an unfortunate degree.

Undoubtedly, the most carefully organized system of training is practiced by the Midiwin society of the Ojibway. Their ritual and training is as carefully graded as that of the Masonic order, to attain the entire degrees possible in this society occupies about twenty-one years of constant study and training associated with a blameless life, a reputation for honor, honesty and bravery. I have known several members of this order and I am proud to have won some of them as my esteemed colleagues and friends. Father Claude Allouez who first came in contact with this society in the early days of the French Conquest of Canada about 1666 speaks of them in the highest terms both as medical men, skilled in the treatment of the diseases and accidents prevalent among their people and as priests. The Father was much elated to find that they used the sign of the cross in their ceremonies and to this he attributed many of their virtues but of course this sign was used really, as has been the case with very many primitive peoples, as a phallic symbol. Among the Hopi it signifies in certain associations the gateway or opening into heaven.

Father Marquette in 1673, speaking of the Ojibways, states that "They have physicians amongst them toward whom they are very liberal when they are sick, thinking that the operation of the remedies that they use is proportional to the presents they make unto those who have prescribed them." This, of course, indicates the high mental and social status of the Ojibway, and in so far as I am aware, dates the first official recognition in America of the high priced specialist.

The Midiwin also recognized or permitted, in a sort of way, certain groups of irregular practitioners or quacks,

very much as certain of our modern and very dignified medical societies are also inclined to do.

Hrdlicka, Bourke, Dodge, and other students of the Amerind suggest that among other tribes, notably among the southwestern nations, the existence of similar societies of a priestly-medical character, and of course every one is familiar with the powerful organization of the priest craft among the Aztecs, a power which finally overthrew the Spanish persecutions. Medical men have ever been restless under restraint and jealous of Liberty.

In most tribes specialization was fully recognized. Quite naturally and decently, obstetrics has been mostly directly overlooked by medicine women and as to the skill and efficiency of many of these, it is very fair to conclude that many of them quite equalled at least the midwife of to-day.

Others were best or exclusively known for their skill in the treatment of wounds, fractures or other injuries. Still others won their reputation in this or that condition, in the management of diarrhoea, of rheumatism and the like. Quite naturally, from an ethnological standpoint, that practitioner most respected was he who at least esteemed himself most near to the great mystery—the psychological or neurological, or shall we say the spiritual head, the Bishop of his flock. The point to be made is that special skill was fully and discriminately recognized.

However chosen, the medicine man was looked upon and truly represented in the eyes of the tribe what you and I desire to represent before our people and fellows, a man of probity and force, a man of dignity, as befits one who stands between nature or God and man. His was not only the function of the relief of pain and the alleviation of suffering, he was also the interpreter of nature and of nature's ways; he stood as we desire to stand battling for a better understanding between the people and God or nature. The inaccurate, but always picturesque, Catlin states (p. 47): "In all councils of war or peace, the Medicine Men held a seat with the chiefs. The greatest de-

pendence and respect is paid to their opinions." In a great many tribes not only was he the spiritual and council chief but also the leader in war and as such he was expected to lead not only in the planning of the enterprise, but also in the actual engagements in which, because of his supposed knowledge of things spiritual, he was expected to undertake all sorts of hazardous adventures and to excel in daring and bravery. Such a position the Medicine Man occupied in all tribes. Though, doubtless in many instances, mere jugglers, charlatans and men of low ideals who may have, through shrewdness and plotting, attained to such a position, in most instances he was a sincerely devout man representing for his people the highest of its ideals and aspirations. All those who have seriously investigated the Medicine Man and Indian medicine speak of this fact, even the most hard of his critics, the missionaries. As Francis LaFlesche, the Omaha, has said, "Observed by the casual, the irreverent or the captious, his ceremonials, his symbols, his dress, his songs and his dances might represent but the more or less seriously assumed wiles of the conjuror or fakir."

My own observation has impressed me with the earnest sincerity of these men. On some occasions when I have been able to convince medicine men through several days of acquaintance that I was in no way inquisitive through a desire to ridicule or from mere idle curiosity, they have confided to me a good many of their beliefs and practices and they have asked me what I did in such and such conditions. Once among the Supi where I had been introduced by a man in whom they had great confidence, the old medicine man took me to several of his most sacred places, really points of great prehistoric archeological interest which I was most anxious to see. He finally became so friendly with me that after I had made suggestions to him as to our methods, that he extended to me the freedom of his fig trees, then laden with most luscious fruit. When I came to leave the people, he told my friends that I was a very fine fellow and that I was probably a first rate

medicine man, quite good enough for mere white men but I certainly ate too many figs.

The Indian medicine man has contributed very much to the needs of the trapper, miner, explorer and to that of the pioneer in general. My own first family physician was Old Baptisse, a Sioux medicine man. He was held in such respect and affection by the settlers in the neighborhood of the Winnebago agency that when his people were removed to a more distant agency, he was requested to remain and the government built for him a house and maintained him because of his usefulness in the community. He died after a long, honorable and useful life, beloved and respected by all his neighbors, white and red alike.

Due to the peculiarities of their life and customs, differing naturally among the various tribes the types of disease and injuries prevailing differ considerably from those chiefly occurring with us.

The primitive American Indian knew but little of the infectious diseases. Benjamin Rush, who much interested himself in the subject of Indian medicine, states after his studies of considerable extent on this subject, that the uncontaminated Indian knew but little or nothing of tuberculosis. His conclusions have been in large part corroborated by the highly scientific research of our greatest authority on Indian ethnology, Ales Hrdlicka, who positively states that pre-Columbian bones show no lesions of this kind (*Tuberculosis among certain Indian tribes of the United States*, p. 1). The infrequency of infections among the Indian even illustrated to this day among the most isolated and primitive peoples, has been due, for the most part, to their largely segregated and generally hygienically desirable habits of life. Otherwise, as Darwin early demonstrated, these primitive and unaccustomed peoples, when exposed to the usual infections of civilization would have succumbed to them in an astonishingly rapid and fearful way. It is very probable that this infrequency of infections among the Indians accounts in general for

their absence of effectual treatment for them. Indian syphilis, as Hrdlicka has said, is an accomplishment derived from the white man and still the tribes of the Southwest have evolved a specific (*Yerba mansa*) which they believe to be of very efficient character against it. In so far as I know, however, no real scientific test of this cure has ever been made.

Little or no knowledge of the neoplasms existed among the early Indians and, in so far as I have been able to discover, the malignant tumors were unknown among the early and pure Amerind races. Even to-day those who have investigated this subject assert, and probably accurately, that neoplasms and especially the malignant ones, are extremely rare among the more pure tribes. I have myself never seen a carcinoma or sarcoma in an Indian. It was my privilege several years ago to point out the interesting correlated fact that among the primitive pure species of wild animals bred under natural conditions neoplasms are either extremely rare or entirely wanting (*Trs. N. Y. Zool. Soc.*).

After a most exhaustive and thoroughly scientific study of the subject, though chiefly based on the Southwest tribes, Hrdlicka (*Physiological and Medical Observations*, p. 30) states that there is nothing in the present conditions of life among the Indians in question (those of the Southwest and West) on which the basis of important physiological differences between them and the whites can be shown. Nonetheless, even under the present less fortunate, as compared to the old methods of living, Hrdlicka states that nonogenarians and especially centenarians are in greater proportion than among native white Americans.

Obesity and arteriosclerosis are observed practically only in reservation Indians or in such others as live under considerably modified conditions approximating in diet and habit the conditions of the white man. Tuberculosis, syphilis, the acute epidemic infections, ophthalmia and trachoma are the contributions of civilization to his misfortunes.

Insanity is rare (*ibid*, p. 175) and cripples, except those who are a result of tuberculosis, syphilis or accidents are few. Disorders of the endocrine system also seem very infrequent and those of a neurologic nature, except hysteria, also appear to have been uncommon.

All authors remark on the fact that whereas much was wanting in the efficiency of internal treatment among the Indians, their management of wounds, fractures and other traumatisms have, from the very earliest records, been of a very high standard. These were matters with which, from the requirements of their life, they were obligatorily familiar. In frontier medicine much, one may even say most, of the settlers' knowledge in regard to the treatment of traumata has been bodily copied from the Indians. From my boyhood life on the frontier, I may also add, I had ample evidence of the influence of Indian medicine on internal practice as my mother gave it to me in various water decoctions and simples, of by no means fond recollection.

With the Indian, the term Medicine had a far wider meaning than with us, as indeed its adoption into our language of slang indicates, for we speak of this or that thing as being "bad or good medicine." However used, it signified mystery and power united, it might be good or bad according to its origin or according as it was swayed by those resorting to it, for public or private interests.

Once invoked, always by elaborate ceremonials, the article thus dignified was supposed to be powerful and sacred, and as such not to be used for commonplace purposes. A spear, a garment and most of all a pipe, was thus made sacred and infinitely powerful, not because of itself, but because of its symbolism. A pipe once used for the purpose of medicine would never be employed for commonplace or secular purposes. It is interesting to note in this regard that not the pipe but the stem was the sacred portion of the medicine pipe, and as such was appropriately decorated. Though not idolatrous, never worshiping the article, perhaps no people have more highly developed the

use of symbolism than has the Red Man. Because of its sacred, powerful and important nature the practices employed for the relief of sickness were also spoken of and considered as medicine and no sharp distinction between such methods and those of a purely religious nature was made; they were thought to be identical in origin and in application.

Like most of the higher types of man, the Indian recognized two great powers or forces in the spiritual world, the one good and beneficent, friendly to the interest of the good man, the other inimical to the best interests of the race and of its laudable individuals. Thus it is seen that in its essential qualities the religion of the Indian very closely approximated our own prevailing theological ideas. With the Indian our God, one and Almighty, was the Good Spirit or the Great Spirit; our Devil, or Satan, is his conception of the Bad God. If we question our religious ideas closely I think that we shall still find that a large proportion of our people still believe that disease and misfortunes, physical and spiritual, are sent by Satan or perhaps because they have in some way offended the mandates of our God, or his laws as established in nature. I do not assert that this idea is a medical or scientific one, but is the one probably most generally held by the layman. This is precisely the Indian conception of disease and it really lies very closely to our own ideas. We thank God for prosperity, health and perhaps sometimes "that we are not as others are." The Indian, in his unsullied religious concepts, did the same thing.

Disease, then, to the Indian is the result of the machinations of the Bad God or occurs because of offense to the Great Spirit.

Propitiation or sacrifice because of sickness or to prevent it was a natural corollary and the Indian took full cognizance of this viewpoint in his treatment of disease. The religious among us do precisely the same thing.

When he believed that the disease was due to the influence of the evil god, or that the condition was dependent

on witchcraft, in which he had the same implicit faith as our kindly forefathers of Salem, he worked spells or sought to cast out the devil by ceremonials; at times, as was more frequent among the orientals, by the punishment of figures made to represent those supposed to be responsible for the afflictions.

When, however, injuries and wounds were to be dealt with, the real hard sense and judgment of the shrewd Indian appeared. He had few illusions or theories to account for these as had the Greeks or the early Teutons. All the heroes of early mythology were wont to account for their failures or physical misfortunes as almost inevitably due to some intervention of Venus, or Wotan or of some other perfectly irresistible force. I question very much if any Indian maiden ever succeeded in putting over a pregnancy as due to a shower of gold, or to the energetic intervention of a pet swan. The Indian sanely attributed his physical injuries to his own inefficiency or to the greater skill of his opponent and, as a result, mystery lacking, his treatment of these conditions was marked by its solid practicability and hard common sense thus resulting, of course, in consequent skill. He had no antiseptics but some of the cleansing lotions and healing powders which he employed probably often served as such (*American Hand Book of Indians*, p. 837).

On the whole, taking into consideration his period in man's evolution, his surroundings and the disease conditions with which he had to contend, we must confess that the medical practices of the Red Indian were at least as sanely based as those of any other people. They were fully as much, if not more than usually successful in their application as compared to those of the white people of the same period. How can we ridicule the Indian's idea of disease and its cure and induce him to accept our concepts when the missionaries tell him that instead of praying, dancing or doing penitence to the Great Spirit, he must do the same thing but in different form to the God of the white man?

In the treatment of his patient, the attitude of the Medicine Man was that of a person who from his learning, his knowledge of the frailties of man and, above all, who because of his relationship to the Great Spirit in his professional guise, no longer represented a man of his people, for he considered himself and was considered by his patients as representing God. His dress, or his lack of dress, for in some instances, as stated by La Flesche, he appeared absolutely naked, as representing his casting off of human frailties and characteristics; such painting as he essayed, such decorations as he employed, were all of significance to him and we have every reason to believe that in most instances he was entirely sincere in his belief in himself. As representing his concept of the Great Spirit he was for the time being omnipotent and competent for anything. Absurd and almost comical as much of his make-up and ceremonies appear to us, we must remember that each article of dress, each line or tinge of paint was symbolic and therefore of the utmost importance. It is interesting to note that among most Indians, there was no confusion between the article—let us say of dress and of that idea which it represented—it was not the article, but what it symbolized. In the preparation of his drugs or in the laying of his dressings or applications, therefore, all these matters were of the most elemental importance. He had learned by observation, by clinical experience, as we should say, that certain herbs, or certain methods were efficient in the relief of certain conditions, when to these the infinite power of the Great Spirit was added, he believed that the efficacy of the method was only limited by divine restrictions.

Hence it was that his drugs were always mixed or combined according to certain fixed ceremonies or forms and that the manner of their taking was also of very great import.

Imbued as he was with the primitive concept that disease was due to the action of malevolent spirits or forces, it is quite natural that in certain conditions the attempt

should be made to frighten away or to otherwise displace these. This action was further expedited in his pharmacopoea by elimination, the sweat, by emetemeses and by purgation, by the use of the rattle, the medicine drum, and the roarer which is significantly like the dreher of the Hebrew.

Treatments were commonly long continued and throughout the guise or attitude of the patient should be that of one willing and expecting to sacrifice and to submit himself to discipline and authority.

Dressed, then, according to some accepted authority or as the visions and inspirations of the operator might direct, the Medicine Man seated himself by the side of his patient, and having first smoked, blowing the smoke to the cardinal points of the compass, thus soliciting the assistance of the Gods, the practitioner proceeded to exorcise his patient, or the evil influences which beset him, first adopting a position of intercession and supplication on the part of the priest and one of sacrifice or submission on the part of the patient. Then the direct methods which training or superstition had demonstrated as efficacious in such a case were applied.

Whatever of humbug and charlantry may be urged against the medicine of the American Indian can be advanced with equal truth against all forms of medical practice of the same period. Dodge has well stated that there is no more absurdity in any of the esoteric ceremonials of the medicine lodge than may not be urged against the appeal of the highly cultured and artistic Greek to his oracle, and certainly no more jugglery or hokus pocus was ever practiced by the Wolf Woman or by Tecumseh than was customary with the priests of Rome in her greatest day. Further we may quite confidently say that nothing in the medicine of the Red Man has ever approached in sublime absurdity the teachings of modern Christian Science, osteopathy and similar cults, some in part recognized by the State of New York. I cannot conceive of any

Indian so obtuse and mentally defective as to deny the existence of a broken bone or a spear-thrust wound.

The Indian always has been and still is an intensely religious person. What more natural than that he should mingle his reverence with his physical ills. We who even now look with not too captious eyes on Emanuel Clinics and who admit the utility of psychoanalytic methods must confess the very direct bearing of the psychic on even convalescence in surgical conditions and we must all fully comprehend the importance of the mental viewpoint in many disease conditions, as in hysteria, Graves' disease, tuberculosis and even shock. We define and treat psychasthenia, neurasthenia, melancholia, and the like; we must therefore accord full recognition to the Indian medicine man who took account of the spiritual in all disease states.

In the treatment of the purely psychic and in physical ills also, the influence of the spiritual was alike employed whether in an attempt to eliminate the results of an evil God's machinations or in the preparation of a decoction for a diarrhoea, prayer, ceremonials or actual sacrifice, the rattling and dancing were supposed to add to or to give therapeutic efficiency. Just why the click of the rattle and the thump of the medicine drum are so absurd when the tinkle of the mass bell and the thunder of the organ give us spiritual uplift to fit us for combat with our problems, is beyond my philosophy.

There can be no question whatever but that to the highly spiritual and believing Red Man all of the careful ceremonials of the Medicine Man did much in a curative way and the criticism of even the most exact scientist has always granted in most instances the earnest belief and thorough honesty of the Indian practitioner. Hrdlicka in mentioning the ceremonials which he witnessed at the sacred Huichol pool of Santa Catharina confesses that he never observed a more impressive and earnest ceremony. There is no question but that these men, the most learned and intelligent of their tribe, believed thoroughly in their efficiency and in the sanctity and utility of their ceremonies.

These psychic methods almost universally practiced by the Indian, and we may add parenthetically by all civilized peoples before and after them, were primarily designed first to attract the confidence of the sick person, secondly to put him in a mental status so that belief in a possible cure was created and thirdly to give ocular evidence, symbolic or otherwise, that this had been accomplished.

The absurdities of the method in their final analysis, resolve themselves into the simple fact that an appeal to confidence must be made by different avenues, for we neither think nor symbolize as does the Indian.

As to clinical results. Col. Dodge in his discussion of this subject commends the historical astuteness of Chief Joseph of the Nez Perces by his rejection of white physicians and their methods after they had given up the case of his beloved daughter as hopeless and yet Dodge states that a cure was effected by the Indian Medicine Man. Those of you who have seen these men work and who appreciate the difference of viewpoint of the red patient from our own, can well understand the possibility of such a result.

But let us now turn aside from this aspect of the practice of medicine among the Amerinds to consider what appeals to us as scientists, that is, the customs of clinical or physical medicine in vogue among our professional predecessors.

All explorers and scientists from the very earliest down to our greatest ethnologists of the present day admit that in the treatment of accidents, of fractures and contusions and of all except penetrating wounds, in the advanced tribes as the Sioux, the Cherokees, Ojibways, Apaches, Navahoe, Hopi and Pueblo, the general management of such accidents was excellent.

I presume the minds of most of you, when we begin the discussion of the drugs of the Red Man, at once turn to tobacco. It is true that we owe to the Indian a great

debt of gratitude, or at least those of us who smoke do, for tobacco. Tobacco was smoked by practically all Indian people for as far back as their history goes. It was ever one of their most stable articles of inter-tribal traffic and a study of their smoking customs and even of their pipes alone forms a most interesting and fascinating side line of Indian ethnology. It is true also that among the pioneers, tobacco was used for many medical purposes, chiefly as an emetic or for local counter-irritation or absorption. The European physicians quickly adopted it to their purposes and some of the most entertaining, and in a way amusing, early medical literature that I have ever read has been the vigorous arguments, pro and con, waged concerning the merits of tobacco by the learned men of our science in Europe, or most entertaining of all, as is usually the case, the learned articles on the subject written by the clergy-fakirs and egotists greater than any of their brothers of the tepee and medicine lodge. But the Indian himself rarely used tobacco for medical purposes as we understand the term. I am much persuaded with him that he put it to a better purpose.

With him the weed was a sacred one, used almost exclusively for either sacred ceremonials or for an expression of friendly communion. The Indian was not, nor ever has been, a solitary smoker. He has enjoyed his nicotine in the tepee circle or in the ceremonials of tribal import or in those of the medicine lodge. He has used it to place him in that dreamy semi-hypnotic state in which he has seen his visions and dreamed his dreams. It has sealed his friendships, confirmed his treaties and alliances and been the genial assistant of many of his war and national compacts. I have a very high opinion of the Indian, and certain of his ceremonials are still in high vogue wherever men of our calling are gathered together.

The Algonquin legend of the origin of medicine is a particularly beautiful and typically Indian one. Diseases were sent to man by the angered wild animals for the cruelties which man had practiced upon them.

Previous to this time there had been no need for medicine, except for such as were skilled in the treatment of wounds and injuries.

With this sudden appearance of "schrecklichkeit" man was very much worried and ~~im~~plussed and the news and cause of its infliction was conveyed to him by the chipmunk who as a punishment received from the other animals his stripes, a style since much affected by persons esteemed to be in like malodor or social unrest. Having recovered from his chastisement the retaliative chipmunk called together all the vegetable kingdom, each one of which in the Indian theology of course possessed a spirit and individuality. As a result of this first vegetarian conclave the spruce, the pines and the balsams gave to man their healing gums and balsams, the slippery elm dedicated his demulcent benefits to the confusion of laryngitis and pharyngitis. The sassafras, the prickly ash and summach, each gave of their beneficial actions and the mandrake, wintergreen, catnip and boneset contributed their respective pharmacologic effects. The lobelia placed himself at the relief of the over-fed and the peppermint, spikenard, gentian and wild ginger all proffered their assistance in the "nach kur."

This friendly act on the part of the chipmunk caused him and his descendants to be much beloved by the Red Man and his love and respect for this animated dynamic and vociferous bit of fur and egotism has descended to us and has been perpetuated in the mandates of our game protective laws.

Drugs were, of course, prepared and administered mostly in a very crude way. They were usually given in the form of decoctions, though embrocations were very extensively used and certain drugs were eaten in their raw state. Drugs were commonly selected or gathered with important ceremonial observances and where preparation was necessary this was also commonly accomplished with much ceremony. Drugs were also administered with ceremonials and considerable dignity, a custom represented with

us by our \mathcal{R} and the stately array of our pharmacists' shelves.

Notwithstanding the fact that constipation is much less common according to Hrdlicka with the Indian than with us, purgatives are numerous in their armamentarium and nearly all the various types of laxatives were in use by them. The salines were represented by the resort to many mineral springs now appropriated by us very largely, as, for example, those at Saratoga. The material obtained from salt licks (chiefly various salts of magnesia) were also in general use. The aloes group, mandrake, cascara, etc., were in full recognition by those tribes living in localities where these plants grew, in fact, a general familiarity with the medical properties of accessible plants seems to have been the rule. The laxative effect of bulky and cellulose articles of diet was as fully understood in Arizona, Mexico, Minnesota and Canada as they now are in Battle Creek and leaves, fibrous fruits, the husks of cereals, and grass pulp were the efficient breakfast foods of the constipated Indian long before the perpetration of the advertising man.

Emetics were apparently much more popular with red patients than they are with modern whites, and the Indian practitioners were fully familiar with lobelia, stramonium, and with many other drugs of this class. Emetics were used apparently correctly, that is as we should, but much more commonly than is the practice with us, though perhaps but little less than was the accepted practice but a few generations back when it was as much a custom to "Pewk and Purge" as Rush says, as it now is to give the routine dose of sulphate of magnesia in our large hospitals. Perhaps with as little real reason at times. Emetics were used very often as a part of the religious ceremonials and it is still the custom, as for example in the familiar snake dance of the Southwest tribes. The process had the same significance as the washing of the hands of the priest, namely, to present the suppliant before the Great Spirit cleansed, literally and in the words of our scriptures,

"Purged clean." But emetemeses was also employed when indigestion from overeating was threatened, or when foods or other materials believed to be unhealthy or unclean had been taken. It was and is still quite generally employed in snake poisoning or after the bites of the Gila monster, scorpion, etc.

Diaphoretics were in very general use, one of the most familiar of which was the drinking of large quantities of warm water, frequently flavored with a decoction of sassafras or of some other aromatic. Such a practice is, as you know, very common with us and is especially used by many of the best French clinicians in the form of decoctions or infusions of violet flowers. Many herbs and drugs, some of real value, were also used with this end in view.

Diuretics were very commonly employed and many of those frequently resorted to by the better type tribes we also recognize as of elemental value. I recall most vividly one night in Mexico seeing my two Indian guides brewing in the coffee pot a most delightful smelling decoction from a wild flower which was growing in abundance about us. On request they most generously shared their brew with me—in fact, they seemed, as I thought, pleased and flattered to do so. I learned in about an hour the inspiration of their generosity for I have never seen so brilliant a diuresis. The joke was on me but I have often regretted that I have not investigated the matter further, but in a less personal way. Urine, usually collected or given with appropriate ceremonies, was used for its diuretic effects, as was also the case with most of the other practitioners of primitive medicine, as, for example, among the Greeks. Of course, it did have a real diuretic action though given as outlined in the Indian ritual, I think that it might also have with us an emetic action as well. It depends, you see, on the viewpoint. I remember very well giving one of my Indian guides a dose of salicylate of soda one cold wet night because of a bad myalgic attack. He took it as one gentleman would accept the kindly intended services of another. I was somewhat embarrassed, how-

ever, to find that immediately thereafter he sought the bush to disgorge himself of the disgusting, and, to him, terrifying material.

Febrifuges are very numerous, most of them probably without action, except for their secondary effects on excretion or because of the large amount of water in them. All were probably harmless, which is considerably more than we can say of many of our drugs of this character. Of course in the south, crude forms of quinine were used with real effect and, as we shall later mention, the medicine men for the most part were fully familiar with the efficiency of baths and sweats in the lowering of temperature and in the relief of the pains of fever.

A strange and significant fact in Indian pharmacy is the almost complete absence of drugs of the analgesic class, although sedatives, notably belladonna, stramonium, tobacco and probably the loco weed were widely used for the purpose of inducing hypnotic states for religious or ceremonial purposes. The Indian was schooled to bear pain and to consider himself unmanly in giving way to it. He therefore made few direct efforts to avoid or subdue it. He has very rarely been a suicide to avoid suffering of either a physical or mental character, though very prone to suicide because of dishonor or of disgrace. Like most of us humans, however, he greatly fears the "unknown thing." I well recall a friend of mine who laid open his knee chopping wood for the camp fire one stormy night up in northern Ontario. I wondered and admired the nonchalance with which he sauntered back to the fire holding the lips of the wound together to check the hemorrhage. I also remember the howls of terrified agony with which he greeted the service of my surgeon comrade when he carefully, causing really very little suffering, tied off the vessels and sutured up the wound. My friend was very proud of his beautiful first intention scar until he discovered that the very night of the operation Steve and Chell had carefully ripped the wound open, removed the sutures and ligatures and applied a dressing composed of

mingled Hudson Bay Plug and spruce root thoroughly masticated in the none too clean buccal cavities of our respectful but cautious and doubting Indian comrades.

Stimulants, for which there is an almost universal human craving, have been as earnestly sought and abused by the Red Man as by his white and yellow brothers. Wherever the possibility for the manufacture of alcoholics from the equator to the arctic circle has existed, the primitive man has found it out and used it; he has often abused it, but he has been ever ready to acknowledge the superiority in lethal effects of the white man's product. Stimulants with the Indian, however, have been usually employed more for the purpose of gratification, ceremonials or for ordinary debauches than for their disease removing qualities. Stomachics, however, were employed very generally and for the same purpose as with us. Like most of ours they are chiefly bitters and aromatics.

Drugs and methods to induce uterine contractions were used in tardy labors; abortifacients and means for the prevention of undesired pregnancy were as well understood as among the ancient Hebrews, but I think used with considerably less frequency. In so far as I have been able to find, however, they have never organized societies for the limitation of childbirth. In some respects, as you perceive, the Indians are socially very much behind our highly evolved concepts of culture.

As with us, perhaps the most certain and advanced of Indian therapeutics was not in the field of pharmacology. Nearly every tribe possessed at least one man or woman skilled and deft in the reduction of dislocations and in the the treatment of fractures. Excellent splint work was accomplished by them and none but the most expert of surgeons can criticize many of their results, particularly when considered from the standpoint of the materials at their command. However, the Indian may have indulged in religious theories as to the causation of disease, he was in no way deceived as to the character of accidents and injuries. He did not deny their existence, nor assume

efficiently carried out in some cases even if not designedly hygienic (Navahoe customs).

After epidemic diseases, the better type tribes, the Sioux, the Comanches, Apaches, Ojibways, Cherokees and Chipewas practiced the abandonment of camps and the clothing and properties of the sick were destroyed by fire or otherwise. Whatever its reason, as with many of the Mosaic laws, the result has been that, except where emasculated by the partly adopted customs of the white man, and before the days of the reservation, epidemic contagions were infrequent and fairly well managed, perhaps at least as well as we manage poliomyelitis from the hygienic standpoint.

The value of climatic change in the treatment and prevention of personal, as well as epidemic diseases, were very universally observed and the drifting of the tribes from winter to summer camps was doubtless founded on observation of its benefits. The recommendation, for the chronically sick, of change from the plains to the hills and from the seashore to the mountains was a common matter. Possibly it originated from hunting demands and customs, though more probably from instinctive common sense; the result has been the same in any event.

The efficacy of the sun in the healing of many diseases has been fully recognized by the Red Man, as is, of course, quite to be expected in a people which theologically endowed all objects of nature with life and individuality and who all, at least to a certain extent, adopted the quite logical theology of sun worship, a belief which has always seemed to me as the most natural of all theological faiths.

I have reserved until the last a method of treatment which has been curiously widely and universally practiced, that is, the employment of the sweat bath. Where water and climatic conditions have permitted, the Indian has been almost universally in his natural state a cleanly and bath-addicted person. Nearly all his more important ceremonies begin and terminate with real, as well as figurative, cleansing of the person of the celebrant. The emetic

and cathartic thoroughness of these cleansing methods have never become routine in white theological circles.

The sweat bath has been employed in every tribe and region from the country of the Nauscopees and Swamp Crees to those of the heated zones. In general, also, the methods and purposes of administering the sweat bath have been quite similar in all the tribes, again irrespective of region. Concerning this custom, many descriptions state that the sweat was invariably terminated by the celebrant rushing from the sweat lodge and jumping into the coldest water possible to find, preferably industriously hunting about for breakable ice to make this ordeal more dramatic. As a matter of fact, this was true only in certain conditions and places, and was doubtless sometimes practiced only for certain religious expression, for the sweat bath has been an almost universal preliminary ceremony for nearly all religious observances. In more frequent practice, after the sweat, the Indian sensibly rolled himself in his blankets for a long sleep, or rubbed himself dry or placed himself in the sun. That all the primitive world has been mistaken as to the benefits of the sweat bath in the treatment of many disease conditions, seems to be exceedingly doubtful and practically all peoples have practiced it in one form or another, as we still do.

I think that most of you are familiar with the construction of the sweat lodge, since it is so commonly illustrated and commented upon in most articles dealing with the Indian. Probably all of you who have been in the open places have seen the frame work, at least of the sweat lodges and, at any rate, I hope to show you pictures of them, so we shall not go into their usual structure here, except to point out that in some cases they were communal, in others individual, and they commonly formed an important part in the building and worship of the Medicine Lodge which I also hope to show you.

The Medicine Lodge was a term commonly applied to a structure erected strictly according to many solemn ceremonials designed to propitiate an angered or careless God

or to express the spirit of humiliation, thanksgiving or supplication, either on the part of a person or a people.

It was constructed on occasions of momentous national affairs when the whole tribe or tribes were gathered together for the purpose of council, because of some great public or personal calamity, epidemic sickness, or because of some personal complaint of so grave a nature that it was not felt that ordinary or usual priestly or medical ministrations were sufficiently weighty. Even when the lodge had been built and the people and its priests gathered for the purpose of discussing some tribal or national matter, as the advisability of going to war, for example, it was felt that the moment and place were propitious for the treatment of any private physical ill.

Persons of great piety, wealth or who because of some personal blessing, illness or misfortune or vow wished to undergo the necessary expense attendant upon the building of a medicine lodge might undertake it, of course under the guidance and instruction of the chief medicine men.

Having been constructed according to the ritual, certain ceremonies, depending on the purpose of the lodge, were then performed by the medicine men after which the real object of the ceremony was reached, whether it was a council of war or for the treatment of some sick person.

Almost invariably, because of the universal employment of the sweat, either for religious or for purely medical purposes, the building of the medicine lodge was accompanied or preceded by the building of a sweat lodge, sometimes a large structure accommodating several celebrants or a smaller one designed for but a single person at a time. At times the ceremony of sweat seems to have been carried on in the large structure, that is, in the real medicine lodge, but it appears to have been more usual that those who had been first prepared by the sweat were admitted to the ceremonials in the great lodge.

If, in this talk, I have given you the impression that the American Indians possessed a system of medicine and

Medicine Men suitable to their ills and the conditions of life under which they lived, and, at the same time, one adapted to their stage and type of civilization and life customs, I have given you the idea which I am anxious that you should receive, for I believe this to be the true fact of the case. Beyond this point I do not wish to persuade you, for I am as certain as you must be, that his system and his practitioners were not adapted to our needs, nor fully to our understanding.

The American Indian in his uncontaminated state was a person who is entitled to our infinite respect. With him, the men who represented our calling were highly esteemed and they possessed for their clientele a type of force and character which attracted to them the admiration and confidence of those whom they served. The Medicine Man was a man of distinction among his people, his skill gave results for which his people gladly showed their utmost appreciation in his honor and support. Can we ask more of our patients, or set up a better standard for our own position and that of our science among our people? The Medicine Man was at once the leader and the servant of his people. His was ever an example of caution, patriotism and devotion to such ideals as the time permitted. He has left us perhaps less of real value to the science of medicine than the men of Greece, for he had no literature in which to perpetuate his learning and his service is likely therefore to be forgotten or overlooked. As a man among his men, he has, however, been a noteworthy example, even an inspiration to us who now pride ourselves as members of the same calling.

To those of you who still have the patience to wait, I wish to show some slides, illustrating some of the points of which I have spoken. Some of these slides are very rare and unusual in part. They have been loaned us by my friend, E. W. Deming, who has lived many years among the Indians and who has immortalized in his art much of the history and lore of our red predecessor.

SEGMENTAL HYPERALGESIA AND SEGMENTAL INCREASED MUSCLE TONE IN DISEASES OF THE LUNGS AND HEART *

JESSE G. M. BULLOWA

INTRODUCTION

I propose to describe the nervous impulses originating in the heart and lungs, which are manifest after leaving the spinal cord by projection in various patterns upon the skin, as pain or lowered threshold to the perception of painful stimuli, or by a modification of muscle tone, revealed by changes in the shape of the thorax or by diminished vital capacity.

Segmental distribution of pain and skin tenderness was first described by James Ross in his Manchester address in 1887. Preceding him by four years, Sturge recognized, in connection with the theory of counter-irritation, the importance of the skin representation of viscera. These studies were the forerunners of the brilliant work of Mackenzie and of Head. In the diagnosis of abdominal conditions, the subject has been of interest to surgeons and occasionally to internists.

Visceral distention is associated with actual pain referred to the corresponding or adjacent homolateral segments of skin representation, or with a lowering of the threshold for stimulation by the application of stimuli which affect the protopathic mechanism in these areas, as evidenced by zones of hyperalgesia or of pilomotor response. This stimulation may be by scratching, pinching, by hot or cold applications or by traction on the hair in the given area. The response on the first or the second observation is regarded, because the stimuli sum up and as a result, there might otherwise be confusing spread to adjacent segments.

* Delivered before the Section of Neurology and Psychiatry, December 11, 1928.

Reaction to pain varies in different individuals. As has been pointed out by Libman, sensitiveness may be gauged by the reaction produced by pressure in the direction of the styloid process of the temporal bone. In discussing the problem, I am using, for convenience, though they are schematic, the diagrams and terminology of Head. The main landmarks I have repeatedly confirmed, and they are, I believe, universally accepted.

It is important to know the areas associated with the different viscera, and the order of the appearance of the reflex phenomena in the zones, in the course of disease, either spontaneously or in response to stimulation, if we wish to interpret these responses.

The stimuli arising from the abdominal viscera and their reflex projection have been studied with considerable care, though, in the writer's opinion, their importance has still not been sufficiently emphasized. Especially is this true of the influence of the viscera on posture and body shape; in fact, Spiegel, in his book on "*Der Tonus der Skelettmuskulatur*," has given them no place and has thus entirely disregarded viscerosomatic reflexes.

Because of their more complicated embryological origin, the interpretation of the reflexes from the thoracic viscera is more complex. Through them are explained the pains and aches in the back and the front of the chest, so frequently present in the middle and advancing years, and which often originate in the thoracic viscera. A knowledge of the embryological origin of the viscera in the chest and the resulting segmental projection is essential.

THE LUNGS

It helps us to understand the impluses arising from the lungs in certain pathological conditions if we visualize their development. The lung is unique in that it develops from two different somatic areas. The trachea and bronchial system arises as an outgrowth from the esophagus at the level of the third and fourth cervical segments. Thus is explained projection of pain and spasm into these

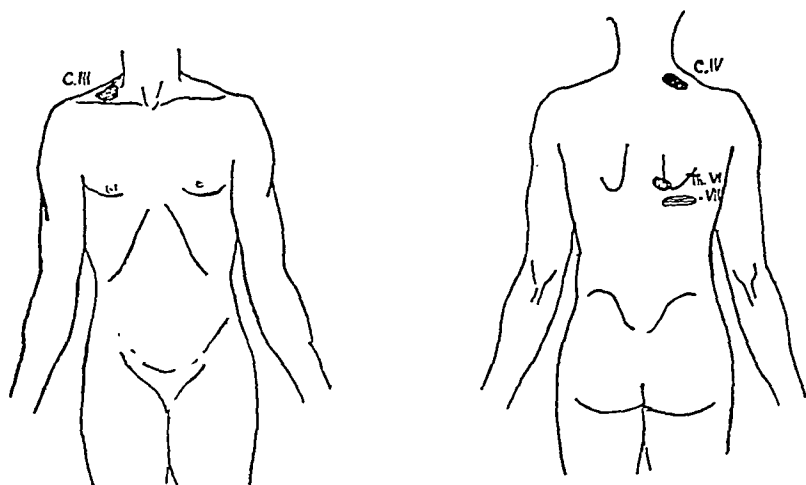
segments. In their development, most organs carry their blood supply from their point of origin. The lungs, too, carry with them the small bronchial arteries, but these vessels do not feed the main circulation through the lungs. The lung buds grow down into a post-bronchial plexus of vessels, which ultimately become the pulmonary circulation. This plexus is situated at the level of the sixth and seventh thoracic segments in the dorsad portion of the body. This origin accounts for the separate projection of impulses from the pulmonary vascular system into these latter segments. Under different conditions, both or either of these segmental zone distributions may be affected. A study of the projection into them, in different diseases of the lungs served to build up the completed picture (See Fig. I).

In early cases of pulmonary tuberculosis, involving the lung substance, there may be projection into both homolateral segment areas, the visceral and the vascular. When the disease progresses, if there has been a marked loss of blood mass, which so frequently occurs with emaciation, the vascular representation disappears, but projection into the visceral segment of lung representation, or CIII and CIV, persists; this may be revealed by the lowered threshold or hyperalgesia. In well nourished patients, where there is no loss of blood mass, the vascular representation may be used as a measure of healing, because the vascular projection disappears when there ceases to be inflammation about the focus.

One has an opportunity to observe, in pulmonary tuberculosis, heart segment reflexes in their purest form. In advanced pulmonary tuberculosis, when the capillary bed is greatly occluded, there is relative distention of the right ventricle, which is evidenced by the appearance of hyperalgesia in the right axilla; rarely does it appear on the left side in addition. In this condition, I have failed to find such hyperalgesia on the left side, to the exclusion of the right.

FIGURE 1
DERMATOMES—PULMONARY MAXIMA

Visceral Cervical III, IV
Vascular or Parenchymatous Tr. VI, VII



MYOTOMES
VISCERAL—CIII AND CIV

Third Cervical Segment

Ant. Rectus capitis, anticus major, Longus colli, Infrahyoid muscles, Scalenus medius, Levator angulae scapulae, Sternocleido-mastoid, Trapezius, Diaphragm, Infrahyoid muscles.

Post. Complexus, Transverso-spinales, Splenius, Erector spinae.

Fourth Cervical Segment

Ant. Rectus capitis anticus major, Longus colli, Scalenus medius (and anticus), Diaphragm, Levator angulae Scapulae, Trapezius.

Post. Complexus, Transverso-spinales, Splenius, Erector spinae.

VASCULAR—THORACIC VI, VII

Fifth and Sixth Thoracic Segments

Ant. Intercostales, Levatores costarum, Triangularis sterni, Obliquus externus, Rectus abdominis.

Post. Transverso-spinales, Erec. spin.

Seventh and Eighth Thoracic Segments

Ant. Intercostales, Levatores costarum, Subcostales, Obliquus externus. Obliquus internus, Transversalis abdominis, Rectus abdominis.

Post. Transverso-spinales, Erector spin.

In lobar pneumonia, at the onset, there is hyperalgesia projected into the visceral and the vascular segments, frequently with considerable spreading. The distensal pain, occasioned by congestion, may be so severe as to simulate pleurisy. I have differentiated it, on several occasions, by local anaesthetization of the skin along the spine, at the level of the segment involved. Pleurisy pain persists after anaesthesia of the skin whereas referred pain disappears. On the third or fourth day of the disease, when the lung is completely consolidated, with consequent occlusion of the vascular bed, referred pain abates. At this time, hyperalgesia referable to the right ventricle appears. It is possible that a high temperature and the consequent evaporation and loss of blood may be protective mechanisms by which the heart is saved from overdistention. At times, the spreading to the anterior segments involved, or to the ones below them, with resultant reflex spasm of the homolateral recti, deceives physicians and surgeons into believing that they are in the presence of acute abdominal mischief. Even after the disappearance of pain, the tender areas and the spasm may remain. The order of their disappearance and the association of the residual segments, however, may prove a guide in differentiating pulmonary and cardiac diseases from diseases of the stomach, gall-bladder and appendix.

At hospitals, no year passes when I fail to see cases admitted as pneumonia where actually there is an acute abdominal condition, or cases operated for a supposed cholecystitis or appendicitis, where pneumonia exists. The association of thoracic visceral segment hyperalgesia and spasm, with abdominal pain and rigidity, should be a protection against this error; but the evidence of the presence of the former is infrequently sought. The presence of both a visceral and vascular hyperalgesia with spreading to adjacent zones should set the physician on his guard. The segment reflexes present should be studied before surgical intervention.

In bronchial asthma, especially asthma of allergic origin, there is a marked response in the segments which project

into the pulmonary vascular distribution. This is evidenced by the very marked soreness in the chest, and hyperalgesia. In bacterial allergy, there may be a predominance of the visceral or cervical representation. In a patient with asthma, where the vascular hyperalgesia is absent I have not seen adrenalin useful. With the onset of the action of adrenalin, which usually takes about six minutes, the vascular hyperalgesic zones disappear. I shall discuss the muscular response in asthma further, in connection with vital capacity.

Counter-irritation is most efficiently placed when it is located at the maxima of Head, of the segment to which the viscus projects its irritation. This is an additional reason for studying the zones of projection. Distressing pains, from the lungs, are at times relieved by anaesthetizing of either the skin over the maxima or of the nerves to them. Recently, in angina pectoris, the attempt to anaesthetize or destroy the sympathetic pathway has been made.

In emphysema, there is diminished pulmonary distensibility, so that the reflex response occasioned by pulmonary distention creates a vicious circle. The chest is held in partial inspiration in response to reflex stimuli; this response, by distending the alveoli, constricts the pulmonary bed and leads to still greater inspiration. Then the still further reduced capillary bed exaggerates that reflex. When the mechanism of respiratory distress, thus occasioned, is understood, it may be effectively treated by depleting the circulation so as to inhibit the reflexes arising from distention of the vessels of the lung. Under certain conditions, the reflex is so marked and so fixed that it is impossible to depress it without deep anaesthesia. When a rigid lung is overstretched, there is danger of lung rupture with subcutaneous emphysema or pneumothorax. Dangerous tearing of the pulmonary tissues may be prevented by separating the lung from the wall of the chest through the induction of a controlled artificial pneumothorax.



FIG 2. Pulmonary tuberculosis with tonically elevated sternum and elongation of the chest in the longitudinal diameter (cephalo-caudad).

Diminution of vital capacity is another evidence of increased muscle tone. Vital capacity is measured by the amount of air which can be expelled from the chest by a maximum expiration after a maximum inspiration. If the tone of the inspiratory muscles is increased, the expiratory muscles may have difficulty in overcoming them, in order to allow the full content of the lungs to be expelled. Let me narrate the case of the patient with an allergic asthma, who has a vital capacity of 6000 c.c. During an attack, this may be reduced to 2000 c.c. After the administration of adrenalin, with relief of the asthma, the tone of the inspiratory muscles becomes normal and the vital capacity is restored to 6000 c.c. This observation has been repeated many times. It is on this account that I regard diminution of vital capacity as very definite evidence of active irritation from the lung, or of the heart, especially if the reduction is recent. I have frequently observed a very marked increase of vital capacity after a Karrel diet. This improvement can best be explained by the diminution of the reflexes which arise from a distended vascular bed; in fact, with the increase in the vital capacity, the skin hyperalgesia representing this bed, diminishes *pari passu*.

The shape of the chest may be evidenced by increased muscle tone. In his discussion of emphysema, Tendeloo pointed out two types which he called (a) the cranial or vertical type of emphysema and (b) the caudally distended chest. He did not realize that there was a visceral and a vascular pulmonary projection, to which these types correspond. The shape of the chest is modified by reflexes originating in its viscera. The elevated and frequently protruded sternum, best seen in profile, is a record from which those instructed may read the story of preceding prolonged increased pulmonary reflex action of visceral or cervical type (See Figs. II & III). The long, narrow, tuberculous chest with its depressed diaphragm, is the result of the same reflex, with a tonically contracted diaphragm and a tonically raised shoulder girdle. It seems to me that fullness of the blood vessels with a resulting elevation by the "elevators of the ribs" is a potent influence in shap-



FIG. 3. Abscess of the lung with visceral and vascular hyperalgesia. There has been spreading to the anterior portion of the 6th thoracic segment in this instance. Note the elevation of the sternum in response to the visceral pulmonary reflexes.

ing the chests of children, far more important than exercise or posture lessons. If the vessels are not distended, as the result of good nutrition, the reflex is lacking and the chest remains flat.

DISEASES OF THE HEART

If we bear in mind the embryology of the heart [a vascular tube twisted upon itself], the peripheral distribution of reflexes arising from its chambers is readily understood. Though originally cephalad, the ventricles become located caudad to the auricles. In valvular diseases of the heart, we may obtain such a dissociation of the segmental representation of the chambers and of the aorta that definite segment representation may be assigned to the different structures (See Fig. IV).

AORTA

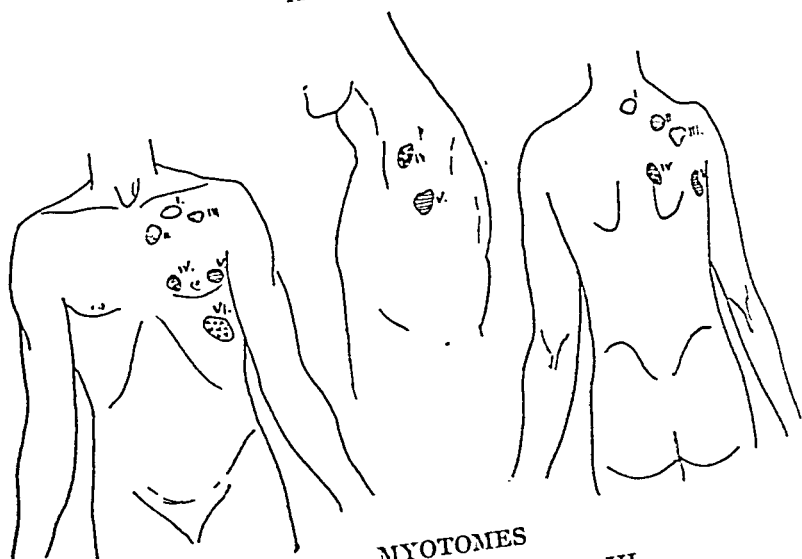
I have twice had the experience of examining patients in whom there had been considerable dispute as to whether certain chest pains were of serious import and represented aortic disease. In both cases, on my first examination I obtained hyperalgesia involving the maxima of the first and second thoracic segment.

In the first case, that of an executive, the vital capacity was not greatly diminished, being, for a man 5 ft. 7¼ in. in height and weighing 135 lbs., 3250 c.c. The blood pressure was 110/74. This man developed, frequently, attacks of distress which radiated down his left arm, after moderate exertion, which passed off as the exertion continued. The electrocardiogram was normal. He died suddenly while in conference.

The other patient, a broker, consulted me with similar symptoms and physical signs. After a particularly hectic day, he complained of fatigue and tenderness in the second thoracic anterior maximum, which radiated into the neck. Several hours after I saw him, he died in his sleep.

In both these cases, there was an aortic arterio-sclerosis with coronary involvements. In one of them, plaques were visible to the x-ray.

FIGURE 4
DERMATOMES—MAXIMA OF HEART AND AORTA
Aorta,—Th. I, II, III
Ventricle,—Th. IV, V
Auricle,—Th. VI



MYOTOMES
AORTA—THORACIC I, II, III

First Thoracic Segment

Ant. Pectorales, Flexors of digits, Flexor carpi ulnaris, Pronator quadratus, Intercostales, Levator costae, Serratus post. sup., Abductor Flexor brev., Opponens digiti quinti.

Post. Transverso-spinales, Erec. spin.

Second Thoracic Segment

Ant. Intercostales, Levatores costarum, Serratus post. (Triangularis sterni)

Post. Transverso-spinales, Erec. spin.

VENTRICLE—THORACIC IV, V

Third and Fourth Thoracic Segments

Ant. Intercostales, Levatores costarum, Serratus post. sup., Triangularis sterni.

Post. Transverso-spinales, Erec. spin.

AURICLE—THORACIC VI

Fifth and Sixth Thoracic Segments

Ant. Intercostales, Levatores costarum, Triangularis sterni, Obliquus externus, Rectus abdominis.

Post. Transverso-spinales, Erec. spin.

AURICLE

In mitral stenosis, I have frequently found a complaint of pain and hyperalgesia involving the sixth thoracic segment on the left side. Occasionally, when there is sufficient back pressure to distend the right ventricle, one finds hyperalgesia of the fourth thoracic segment on the right side.

VENTRICLE

A man of almost 50 years, with auricular extra systoles of transient occurrence, has pain and hyperalgesia involving the sixth segment, with the onset of the extra systoles; this man also has attacks of precordial pain associated with infections of the nose or throat. These latter attacks may occur in the absence of the auricular extra systoles; at such times, the hyperalgesia involves the maxima of the fourth and fifth segments. At the commencement of such attacks, there is hyperalgesia and sometimes pain in the lateral maxima; then the anterior maxima are involved and finally the posterior maxima. This order of appearance has never been departed from. I have never observed hyperalgesia of the fourth or fifth thoracic anterior or posterior maxima in the absence of the lateral. With great fatigue, there may be spreading to adjacent segments and in that case there may be hyperalgesia of the seventh cervical, which is signalized by complaint of pain in the back below the scapula. With rest, or disappearance of the infection, the pain disappears and finally the hyperalgesia. At times, this patient presents the pain in the first and second thoracic segments; this may or may not be present with the other zones and is usually manifest after severe muscle strain or excitement.

It is a noteworthy fact that there are but two zones in the body which present lateral as well as anterior and posterior maxima, *i. e.*, areas in which hyperalgesia persists longest and which are the most sensitive parts of the segment. These are the fourth and fifth segments; they are the ones which correspond to that most important

portion of the heart, the ventricle; they are located high in the axilla. Some observers think that hyperalgesia observed in the axilla is of no significance; they say the skin is naturally more tender there, but this does not take into account its unilateral character and its very definite limitation. Anyone may demonstrate this to his own satisfaction on his own person, by traction of the axillary hairs when fatigued or subject to infection. It is this irritable state in response to strain, which may account for the frequently observed ticklishness in this region.

I have pointed out the skin zones involved with the several chambers of the heart. Segmental increased muscle tone is projected from them, just as in diseases of the lungs or in diseases of the abdominal viscera. It is pertinent to inquire what the evidence of this increased somatic muscle tone in response to diseases of this viscus is. Diminished vital capacity usually exists. There may be shortening or tenderness of the muscle involved which may, as it continues for a long time, be evidenced by tenderness and soreness along the point of attachment. The ribs become tender due to muscle tension, and if the tone is maintained in this way, the muscles become so irritable that, when touched, the separate fibrils contract (myotatic irritability) and finally there is atrophy from overuse. This is a more logical explanation than the local action of toxins in accounting for the atrophy of the shoulder girdle in phthisis, and for the interscapular cupping on the right side in that condition.

There are still other evidences of increased muscle tone, such as increased fatiguability, when the antagonists of the tonically contracted muscles are voluntarily contracted. One patient, who has an irritation of the visceral representation of the lung on the left side, I found had more difficulty maintaining his left arm elevated than his right. Libman believes that fatigue is an equivalent of pain in an hypaesthetic individual.

SUMMARY

In this brief presentation, I trust I have made clear the importance of the reflexes arising from viscera in the chest, and their effect on sensation and muscle tone. The important fact in diseases of the lungs is their origin embryologically from two distinct areas, one, the visceral or cervical origin of the trachea and bronchi as an outgrowth from the alimentary tube—distinctly endodermal; the other, the vascular or thoracic portion, represents the vascular bed of the lung which is mesodermal. The appearance of reflexes from these two elements in combination or separately, has clinical significance.

In diseases of the heart, the segmental projection of the various chambers and the sorta, has been indicated. That only two pairs of segments have a lateral as well as an anterior and posterior area of maximum hyperalgesia under stimulation, is interesting in connection with the fact that these lateral areas are projected from the heart ventricles. The diagnostic importance and clinical significance of pains, hyperalgesia and increased muscle tonus, reflexly projected into the segments from which thoracic viscera embryologically originated, has been briefly described.

THE IMPORTANCE OF EARLY DIAGNOSIS AND EARLY OPERATION IN HEMOLYTIC STREPTOCOCCUS GANGRENE *

(ABSTRACT)

FRANK L. MELENEY

In 1924 a series of twenty cases of Hemolytic Streptococcus Gangrene was reported from the Peking Union Medical College in China.¹ Although this disease is relatively rare in the United States, as compared with China, it does occur from time to time and may come into the experience of any surgeon in the course of a year. It is not common enough for individual surgeons, seeing it for the first time, to recognize it readily and yet its early recognition and prompt operative relief are of the utmost importance to prevent either the death of the patient or the extreme destruction of large areas of skin and consequent prolonged hospitalization.

The course of the disease in untreated cases may be briefly described as follows:

1. It is a rapidly spreading infection arising from a superficial break in the skin, a scratch, a hypodermic injection, a cut, a pimple or a boil.

2. It usually occurs in the extremities but may attack any part of the body surface.

3. The part becomes red, hot, swollen, heavy, numb and sometimes anaesthetic. The margin is not raised nor clearly defined but fades off into normal skin.

4. The general symptoms are profound prostration, indifference to surroundings, a lack of appreciation of the severity of the illness, a rapid pulse without high fever, but with occasional chills.

5. On the third or fourth day discolored dusky areas of skin appear with or without blisters or bullae and the spread continues.

* Delivered before the Section of Surgery, January 4, 1929.

¹ Meleney, Frank L., *Archives of Surgery*, Vol. 9, page 317, 1924.

6. From the fifth to the eighth day the discolored areas become frankly gangrenous and the spread continues.

7. From the ninth to the twelfth day the gangrenous areas begin to separate and the spread may cease.

8. Subsequent separation of the dead skin discloses wide-spread necrosis of the subcutaneous tissues, the extent of which can only be determined by incisions. This necrosis may extend up the whole length of the arm or leg or involve the whole circumference of the limb.

9. Some cases come to a spontaneous standstill and the slough separates, leaving extensive granulating areas. The undermined edges may gradually become adherent and epithelium may grow in from the margin.

10. In most cases without operation the process continues to advance, lung signs develop, metastatic abscesses form, and death ensues if prompt surgical treatment is delayed.

The disease is primarily a necrotizing infection of the subcutaneous fat with secondary necrosis of a part of the overlying skin. This is due to a thrombosis of the skin vessels which pass through the necrotic slough. It does not spread beneath the deep fascia unless the original injury carries the infection to the deeper regions.

In rapidly spreading acute infections of the skin the surgeon should be keenly alert to observe the earliest signs of skin gangrene, a dusky discoloration with or without blisters or bullae. As soon as the skin shows the slightest duskiness, incisions should be made through this necrobiotic skin to and just beyond the limits of the subcutaneous necrosis which are revealed by the incision. Amputation is unnecessary in most cases and should be used only when the original injury has carried the infection to the deeper parts. After adequate incisions have been made, the involved part should be soaked in hot water or poulticed until the cellulitis has subsided. The necrotic skin and subcutaneous slough should then be removed as rap-

idly as possible. The defects will usually have to be covered by skin grafts. Prompt operation makes all of the difference between rapid resolution of the process on the one hand and great destruction of tissue, if not metastasis and death, on the other.

A plea is therefore made for the early recognition of and prompt operation in this disease.

NEW VESTIBULAR COMPLEXES FOR LOCALIZATION OF BRAIN TUMORS *

(An analysis of 139 verified lesions)

(ABSTRACT)

LEWIS FISHER

This series comprised 65 supra-tentorial and 74 sub-tentorial lesions.

The subject is presented from six angles:

1. Findings indicative of a brain lesion, given as spontaneous vertical nystagmus; poor pelvic girdle movements; marked disproportion between nystagmus and vertigo after turning; marked disproportion in the activity or duration of the responses from the horizontal and vertical semi-circular canals of the same side, after douching; loss of nystagmus from the vertical canals, but past pointing present; perverted nystagmus from either horizontal or vertical canals after douching; vertigo, or past pointing, in the wrong direction after stimulation; dissociated movement of the two eyes after stimulation; loss of all vestibular responses after stimulation, with good hearing.

2. Abnormal responses to ear stimulation do not indicate an increase in generalized intra-cranial pressure, and conversely, an increase in the spinal manometric pressure is not always accompanied by abnormal vestibular findings.

* Delivered before the Section of Otology, February 8, 1929.

3. Findings indicative of a sub-tentorial and of a supratentorial lesion: patients with a sub-tentorial lesion do not become nauseated, do not vomit, nor perspire, regardless of the amount of stimulation administered. Patients with a supra-tentorial lesion are frequently quite susceptible.

4. Findings indicative of the laterality of the lesion.

5. Vestibular group-findings diagnostic for each anatomic area.

6. Differential diagnostic signs between various anatomic areas. The first step in the diagnosis is to determine whether the lesion is supra or sub-tentorial. In differentiating the various sub-tentorial lesions the cerebello-pon-tine angle tumors present the most definite complex, namely, the loss of all responses on one side, including hearing, with a loss of the vertical semi-circular canals' function on the opposite side.

Conclusions:

1. A brain lesion usually shows abnormal vestibular test findings.

2. Generalized increased intra-cranial pressure as such cannot be diagnosed by the vestibular tests.

3. The vestibular findings indicative of the laterality of a lesion are definite and reliable, when present, but not all brain lesions exhibit these signs.

4. The vestibular tests can usually differentiate definitely between a supra and a sub-tentorial lesion.

5. Each anatomic area presents vestibular group-findings of its own.

6. While in the vast majority of cases the diagnosis of brain tumors can be made by the vestibular tests, their value would be the greatest when taken in conjunction with the general clinical findings.



L. Emmett Holt.

UNVEILING OF MEMORIAL TABLET TO DR. HOLT

ROYAL S. HAYNES

It is a privilege to address the Pediatric Section on the occasion of the unveiling of a tablet to Dr. Holt. It is a privilege which I have approached with some misgiving for it is not easy to speak about a friend the sense of whose loss the passing days bring freshly to our hearts.

It would be impossible in the few minutes that are at my disposal, were I capable of so doing, to present adequately the claims to our esteem and veneration of the great man most of us have known and have admired. Dr. Holt was a master in so many fields and his activities were so all embracing. As a pioneer in the field of pediatrics and always one of its most eminent exponents, as a wise and experienced practitioner, as a great teacher and author, as a devoted official of this Academy, giving of his best to the accomplishment of the wider field of activity upon which in this new building we are beginning to enter, as a great force in the promotion of Child Health, as a stimulator to research and a research worker—to depict his efforts in any of these roles would challenge the power of one far better endowed than I.

But to-night we have only the side of the teacher to consider, because the tablet you are soon to see is a tribute from his students to the man who taught them.

This tablet is the offering of some four hundred men who during the twenty years during which Dr. Holt was Professor of Diseases of Children in the College of Physicians and Surgeons sat on the benches in front of him and learned not only pediatrics but clear thinking. They are men in all branches of medicine, men who remembered as a great experience the hours they had spent under the spell of his instruction. So that when they were asked, they responded from far and wide to do him honor.

Why was it that this ready response came?

* Delivered before the Section of Pediatrics, May 9, 1929.



IN APPRECIATIVE MEMORY
OF

LEMMETT HOLT

1855 · 1924

PHYSICIAN · TEACHER
FRIEND OF CHILDREN

THIS TABLET IS
PLACED HERE BY HIS
FORMER STUDENTS

ANIMOSUS ATQUE SAPIENS

What were the qualities that made their hours under Dr. Holt seem a great experience? Of the many I would speak of a few.

I would not speak of his erudition. That needs no comment. His text book, which almost at its first appearance became the standard and remained so through many editions, this and his contributions to medical literature speak loudly enough.

But of the qualities that stamped Dr. Holt as a great teacher, I would mention first his simplicity.

Doctor Holt was not afraid to be simple. He made his lectures and his clinics on even the most difficult subjects marvels of clarity. He stated the profoundest truths in the simplest terms so that his lectures were understandable to the beginning student and a delight to the older practitioner who recognized in the lucidity of his style the highest form of art in expression. All could appreciate the mass of information and the authority that lay behind his exposition and value his teaching the more highly for his restraint and his willingness to let the truth speak for itself.

Dr. Holt had a passion for perfection; a sort of divine discontent which was never satisfied by what he did, so high above his accomplishment was his ideal of what it should be. That was why when his great book was, so soon as a new edition came from the press, already in the process of revision and improvement for the next edition, soon to be demanded. That was why on the eve of his lecture day, he spent several hours reviewing the notes of his lecture of the previous year and why even after years of teaching he approached each exercise with some hesitation. Not that this was apparent to his listeners, not that it marred the easy flow of words or left a sense of incompleteness in his class. On the contrary, on several occasions I have seen the class, enthused and uplifted, break out into applause, when such was Dr. Holt's ideal and such his modesty that he would as likely as not even

in the face of this demonstration, turn away with the remark "It doesn't seem as if that went very well to-day."

Dr. Holt possessed intellectual youth. His mind never lost its resilient quality, its adaptability. He never stood still; as his art progressed, he progressed with it and led in its march. He encouraged others to research; he accepted the findings of others if in them he found the truth. This readiness to change, this youthfulness of his intellect was always present and combined with the wisdom of his long experience made him an exemplar of the adage "Be not the first to take the new thing up; nor yet the last to let the old go by."

One other characteristic which made Dr. Holt great, a characteristic that was apparent to his students but even more, perhaps, to us who knew him beyond the classes, was his love for the children he served. Were they in the clinic, in the hospital, in homes, or throughout the land, in particular and in general, he loved them all.

So it has been written on this simple tablet

FRIEND OF CHILDREN

Mr. Chairman, we who do not forget, confide to the Academy which he served so loyally, this tribute to our great Teacher.

MEETINGS OF FOREIGN MEDICAL SOCIETIES

BEGINNING IN JUNE

A number of conferences and congresses will be held in various European centers during the coming summer in which the profession in this country will probably be interested. Among the conferences are the following:

The IIIrd International Congress on Medicinal Plants, Padua, during the latter half of June.

The fifth English-speaking conference on Maternity and Child Welfare. Friends' House, Euston Road, London, July 3 to 5.

The Ophthalmological Congress, Oxford, July 4 to 6.

The Royal Sanitary Institute, Sheffield, July 13 to 20.

The International Congress of Light Treatment, Paris, July 22 to 24.

The Triennial Congress of the International Society of Surgeons, Warsaw, July 22 to 25.

The British Medical Association, Manchester, July 23 to 26.

The Seventh International Congress of Surgery, Warsaw, July 23 to 27.
(This congress will be under the Presidency of Professor Hartmann of Paris).

The Pan-Pacific Conference of Surgeons, Honolulu, August 14 to 24.

The German Society of Neurologists, Wurzburg, in the first or second week of September.

The First Congress of the International Society of Biology, at the Institut Pasteur, Paris, September.

The XIIIth International Congress of Ophthalmology, Amsterdam, September 5 to 13.

(This congress will be under the Presidency of Professor van der Hoeve of Leiden).

The German Pediatric Association, Hamburg, September 15.

The German Orthopedic Congress, Munich, September 16 to 18.

The XXXVIIIth Congress of the French Association of Surgeons, Paris, October 7.

(This congress will be under the Presidency of Dr. Tixier of Lyon).

The International Congress for Sex Reform on a Sexual Scientific Basis, London, October 8 to 12.

(This congress will be under the leadership of Havelock Ellis, August Forel and Magnus Hirschfeld).

The Twentieth Congress of French Medicine, Montpellier, October 15.

The Sixth Congress of Stomatologists, Paris, October 22 to 29.

SECOND ANNUAL GRADUATE FORTNIGHT OF THE NEW YORK ACADEMY OF MEDICINE

OCTOBER 7 TO 19, 1929

EVENING SESSIONS AT THE ACADEMY

"FUNCTIONAL AND NERVOUS PROBLEMS IN MEDICINE AND SURGERY"

FIRST WEEK

October

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| 7 | Opening addresses | Dr. Livingston Farrand, President,
Cornell University
Mr. Clifford Beers, Secretary, The National Committee for Mental Hygiene
Dr. Ludwig Kast, Professor of Medicine, N. Y. Post Graduate Medical School |
| 8 | The involuntary nervous system

Hysteria as a practical problem | Dr. W. Langdon-Brown, Physician, St. Bartholomew's Hospital, London
Dr. C. Macfie Campbell, Professor of Psychiatry, Harvard University |
| 9 | Neuroses following accident

Post-operative emotional disorders, their prevention and management | Dr. Foster Kennedy, Professor of Neurology, Cornell University
Dr. Robert B. McGraw, Assistant Physician, Presbyterian Hospital |
| 10 | Endocrines and the vegetative system

General survey of visceral neuroses | Dr. Walter Timme, Attending Physician, Neurological Institute
Dr. Leopold Lichtwitz, Prof. Int. Med. & Chf. Med. Dept. Municipal Hosp. Altona, Germany |
| 11 | Metabolism and the involuntary nervous system

Headache and migraine | Dr. Anton Julius Carlson, Professor of Physiology, University of Chicago
Dr. Frederick Tilney, Professor of Neurology, Columbia University |

SECOND WEEK

October

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| 14 | The cardiac neuroses

The vascular neuroses | Dr. Robert H. Halsey, Professor of Medicine, N. Y. Post Graduate Medical School.
Dr. Israel Strauss, Attending Neurologist, Mount Sinai Hospital |
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| 15 | Gastro-intestinal neuroses | Dr. Burrill B. Crohn, Associate Physician, Mount Sinai Hospital |
| | The surgery of the vegetative nervous system | Dr. Alfred W. Adson, Assistant Professor of Surgery, University of Minnesota (Mayo Clinic) |
| 16 | Habit and behavior problems | Dr. Herman M. Adler, Director, Institute for Juvenile Research, Chicago |
| | Neurocirculatory asthenia | Dr. Marcus A. Rothschild, Associate Physician, Mount Sinai Hospital |
| 17 | The Carpenter Lecture—The function of the emotions in the production and prognosis of diseases | Dr. Charles P. Emerson, Professor of Medicine, Indiana University |
| | Insomnia and disturbances of sleep | Dr. Carl Pototzky, Director, Nervous Children's Clinic, Kaiserin Augusta Victoria Haus, Berlin |
| 18 | The psychoneuroses | Dr. Louis Casamajor, Professor of Neurology, Columbia University |
| | Psychotherapy | Dr. William A. White, Director, St. Elizabeth's Hospital, Washington |
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LIBRARY NOTES

LIBRARY HOURS DURING THE SUMMER

From June 15 until September 15 inclusive, the Library will be open on week days from 9 a. m. to 5 p. m., on Wednesdays from 9 a. m. to 10:30 p. m., and on Sundays from 10 a. m. to 5 p. m.

RECENT ACCESSIONS TO THE LIBRARY

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- Alport, A. C. On nephritis.
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- Anderson, J. How to stain the nervous system, a laboratory handbook for students and technicians.
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- Ascoli, A. La vaccinazione antitubercolare con bacilli vivi.
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- Becker, W. H. Therapie der Geisteskrankheiten für praktische und Irrenärzte.
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2. Aufl., Leiden, Van Doesburgh, 1928, 112 p.
- Birch-Hirschfeld, A. & Hoffmann, W. Die Lichtbehandlung in der Augenheilkunde.
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- Blackford, J. P. Phrenology; the science of the mind.
2. ed., Brighton, Severn, 1928, 188 p.
- Bloor, C. Temperament, a survey of psychological theories.
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- Chalmers, R. W. Hospitals and the state.
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- Clayton, E. B. Physio-therapy in general practice and for the use of masseuses.
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- Crowley, R. H. Crowley's hygiene of school life. By C. W. Hutt.
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- Dahl, S. Geschichte des Buches.
Leipzig, Hiersemann, 1928, 248 p.
- Das, J. L. Manual of hygiene and public health.
2. ed., Calcutta, Butterworth, 1928, 661 p.
- Devine, H. Recent advances in psychiatry.
Phil., Blakiston, 1929, 340 p.
- Directory of psychiatric clinics for children in the United States.
2. ed., N. Y., Commonwealth fund, 1928, 181 p.
- Diseases of children by various authors. Edited by Hugh Thursfield and Donald Paterson.
London, Arnold, 1929, 1106 p.
- Donhauser, J. L. A surgical diagnosis.
N. Y., Appleton, 1929, 799 p.
- Dorsey, G. A. Hows and whys of human behavior.
N. Y., Harper, 1929, 298 p.
- Esposito, A. Le nefrosi.
Milano, Istituto Editoriale Scientifico, S. A., 1929, 212 p.
- Fernández Martinez, F. Tratamiento de la úlcera gastroduodenal.
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- Fischer, H. Mittelalterliche Pflanzenkunde.
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London, Paul, 1928, 223 p.
- Freudenberg, E. Physiologie und Pathologie der Verdauung im Säugling-salter.
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- Goldzieher, M. A. The adrenals, their physiology, pathology and diseases.
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- Gould, (Sir) A. P. Elements of surgical diagnosis.
7. ed., London, Cassell, 1928, 730 p.
- Granger, F. B. Physical therapeutic technic.
Phil., Saunders, 1929, 417 p.
- Gray, J. Ciliary movement.
Cambridge, Univ. press, 1928, 162 p.
- Green-Armytage, V. B. Tropical gynaecology.
Calcutta, Thacker, 1928, 249 p.

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Madrid, J. Morata, 1928, 198 p.
- Günther, H. F. K. Platon als Hüter des Lebens.
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- Hall, H. J. & Buck, M. M. C. Handicrafts for the handicapped.
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- Handbuch der speziellen pathologischen Anatomie und Histologie. Bd. 4, T. 3. Verdauungsschlauch.
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- Harvey, H. W. Biological chemistry and physics of sea water.
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- Haultain, W. F. T. & Fahmy, E. C. Ante-natal care.
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London, Heinemann, 1929, 126 p.
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- International handbook of child care and protection, compiled... by Edward Fuller...
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- Ischer, A. Albrecht v. Haller und das klassische Altertum.
Bern, Haupt, 1928, 272 p.
- Jaquerod. Spéléologie pulmonaire; étude clinique et radiologique des cavernes tuberculeuses.
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- Joseph E. Lehrbuch der diagnostischen und operativen Cystoskopie.
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- Joslin, E. P. A diabetic manual for the mutual use of doctor and patient.
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3. ed., London, Macmillan, 1929, 884 p.

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Brussels, Lamertine, 1928, v. 1.
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- Stander, H. J. The toxemias of pregnancy.
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- Stone, E. L. The new-born infant, a manual of obstetric pediatrics.
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Syphilis bei dem Foetus...
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- Thomson, E. S. Your eyes and their care.
N. Y., Appleton, 1929, 175 p.
- Thornhill, E. Varicose veins and their treatment by "empty vein" injection.
London, Baillière, 1929, 63 p.
- Torrubiano Ripoll, J. Teología y eugenesia.
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Arezzo, auth. 1924-28. 2 pts. in 1 v.
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N. Y., J. Wiley, 1929, 255 p.
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N. Y., Hoeber, 1929, 199 p.
- Willius, F. A. Clinical electrocardiograms, their interpretation and
significance.
Phil., Saunders, 1929, pp. 13-219.

Wilson, A. The child of circumstance; the mystery of the unborn.

London, Bale, 1928, 420 p.

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N. Y., Appleton, 1929, 661 p.

PROCEEDINGS OF ACADEMY MEETINGS

MAY

STATED MEETING

Thursday Evening, May 2, at 8:30 o'clock

Program presented in cooperation with
The New York Pathological Society

ORDER

I. EXECUTIVE SESSION

Election of Fellows

II. PAPERS OF THE EVENING

- a. New methods in the serodiagnosis of syphilis, Ernst Meinicke, Hamburg (by invitation)

Discussion, John A. Kolmer, Professor of Pathology, Graduate School of Medicine, University of Pennsylvania (by invitation)

- b. The functions of the gall bladder and some of their disturbances in the light of recent investigations, Béla Halpert, Department of Pathology, University of Chicago (by invitation)

Discussion including physiological data concerning the regulation of the bile flow through the bile passages, B. P. Babkin, Research Professor of Physiology, School of Medicine, McGill University (by invitation)

- c. Studies on malignant sclerosis of the kidney (Volhard-Fahr), Paul Klemperer, Sadao Otani, Mount Sinai Hospital (by invitation)

Discussion, Arthur M. Fishberg, Herman O. Mosenthal

SPECIAL NOTICE

There will be no Stated Meeting of the Academy on May 16.

SECTION OF SURGERY

Friday Evening, May 3, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. 1. Squamous cell carcinoma of the nose
2. Basal cell carcinoma of the naso-malar region
3. Carcinoma of the tongue with complications, William F. MacFee

- b. 1. Rupture of small intestine following horse kick
2. Acute ileus following appendicectomy, James R. Lincoln
- c. Neurogenic sarcoma of median nerve with amputation of the arm,
Bradley L. Coley
- d. 1. Multiple intestinal fistulae
2. Adenomata of sigmoid colon, Paul W. Aschner
- e. Seven cases illustrating paper of the evening, A. L. Soresi

III. PAPERS OF THE EVENING

- a. Indirect injuries to the heart by needles and similar foreign bodies,
J. William Hinton
- b. Empyema thoracis—early and late results with author's method,
A. L. Soresi

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Election of Officers

For Chairman—William Crawford White

For Secretary—Otto Carl Pickhardt

For Advisory Committee:

To serve one year: E. W. Peterson

To serve two years: Charles E. Farr

To serve three years: Walton Martin

To serve four years: Frederic W. Bancroft

To serve five years: Edwin Beer

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, May 7, at 7:45 o'clock

ORDER

I. PRESENTATION OF CASES

- a. Neoplasms of the skin, benign and malignant
- b. Miscellaneous cases

II. a. TUMORS OF THE SKIN, Alexander Fraser

- b. His new test for syphilis, Med. Meinicke

III. DISCUSSION OF CASES

IV. EXECUTIVE SESSION

Election of Officers

For Chairman—J. Frank Fraser

For Secretary—Max Scheer

For Advisory Committee:

Sigmund Pollitzer

Isadore Rosen

Chas. W. Williams

J. Gardner Hopkins

Edward R. Maloney

Note: Examination of cases is limited to members and their invited guests.

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, May 8, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. Historical side lights on the etiology of puerperal fever, Irving S. Cutter, Dean, Northwestern University Medical School, Chicago (by invitation)
Discussion, Benjamin P. Watson, George Gray Ward
 - b. Medicine in China, old and new, Edward H. Hume
Discussion, J. L. L. Duyvendak, Oegstgeest, Holland, William Wesley Peter, L. C. Goodrich (all by invitation)
- III. Riviere, originator of diathermy; by title, A. Bern Hirsch
- IV. EXECUTIVE SESSION
Election of Officers
For Chairman—Karl Vogel
For Secretary—Charles E. Atwood
For Advisory Committee:
To serve one year: Louis F. Bishop
To serve two years: Charles L. Dana
To serve three years: Rufus I. Cole
To serve four years: C. N. B. Camac
To serve five years: B. Sachs

SECTION OF PEDIATRICS

Thursday Evening, May 9, at 8:30 o'clock

ORDER

- I. Unveiling of Memorial Tablet to Doctor L. Emmett Holt, Royal S. Haynes
- II. Case report, C. H. Smith
- III. PAPERS OF THE EVENING
 - a. Congenital hip disease. Diagnosis and treatment in infancy, Charles H. Jaeger
 - b. The Kahn Test in infantile and early juvenile syphilis, John Caffey, Katherine Kriedel, B.A. (by invitation)
Discussion, Med. Meinicke, R. L. Kahn, Director of Laboratories, University Hospital, Ann Arbor, Michigan (by invitation), John Gardner Hopkins
 - c. Successive roentgenograms of the chest of children during measles, Jerome L. Kohn
Discussion, Leon T. LeWald, James Denton (by invitation)
- IV. EXECUTIVE SESSION
Election of Officers
For Chairman—F. Elmer Johnson

For Secretary—Hugh Chaplin

For Advisory Committee:

To serve one year: Charles Hendee Smith

To serve two years: Stafford McLean

To serve three years: Louis C. Schroeder

To serve four years: Murray H. Bass

To serve five years: Royal S. Haynes

SECTION OF OTOTOLOGY

Friday Evening, May 10, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. 3 cases of temporo-sphenoidal abscess

b. Cerebellar abscess, Richard T. Atkins

c. A case of caisson disease of the labyrinth, J. G. Dwyer

d. 3 cases of mastoiditis in diabetes

e. Lateral sinus thrombosis with *B. coli* infection, F. W. Graef (by invitation)

f. An atypical mastoid with unusual symptoms, Charles M. Griffith (by invitation)

g. An unusual case of mastoiditis, John Miller

h. A case of acute labyrinthitis, operation, recovery, Hugh B. Blackwell

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Election of Officers:

For Chairman—James Garfield Dwyer

For Secretary—Hugh B. Blackwell

Advisory Committee:

To serve one year: Edward B. Dench

To serve two years: Wendell C. Phillips

To serve three years: Thomas J. Harris

To serve four years: Richard T. Atkins

To serve five years: Clarence H. Smith

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, May 14, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICAL CASE

Unusual sequelae in chronic encephalitis, Walter Bromberg (by invitation)

III. PATHOLOGICAL PRESENTATIONS

From the Neuropathological Laboratory, Mt. Sinai Hospital

a. Fulminating case of chorea, A. N. Bronfenbrenner (by invitation)

- b. Metastatic carcinoma of brain and cord simulating polyneuritis,
Herman Selinsky (by invitation)

Discussion, Joseph H. Globus

IV. CASE REPORT

Disappearance of tremor in a case of paralysis agitans following an
attack of hemiplegia with comments on the production of the
tremor in paralysis agitans, Junius W. Stephenson

V. PAPER OF THE EVENING

Aerophagia as an important factor in the neuroses and suggestions
for relief, George A. Gosselin, Hartford (by invitation)

Discussion, Irving H. Pardee

VI. EXECUTIVE SESSION

Election of Officers

For Chairman—Moses Keschner

For Secretary—Michael Osnato

For Advisory Committee:

To serve for one year: E. D. Friedman

To serve for two years: H. A. Riley

To serve for three years: Byron Stookey

To serve for four years: I. S. Wechsler

To serve for five years: J. W. Stephenson

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, May 15, at 8:30 o'clock

Program to be presented by the Staff of the James Buchanan Brady Foun-
dation for Urology of the New York Hospital

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES AND NEW INSTRUMENTS

- a. The value of indwelling ureteral catheters—three cases, Robert Gutierrez
- b. A bladder with three ureteral orifices on one side and one on the other, Frederick T. Lau, Roy B. Henline
- c. Radiograph of fleshy mole resembling a renal calculus, William R. Delzell (by invitation)
- d. Experience with a new baby cystourethroscope, Paul M. Butterfield
- e. A new operating cystoscopic rongeur, Thomas J. Kirwin
- f. Cystine calculi—three cases, Roy B. Henline

III. PAPER OF THE EVENING

Embryology, anatomy and surgery of the human prostate gland, Oswald
S. Lowsley

IV. EXECUTIVE SESSION

Election of Officers:

For Chairman—Archie L. Dean, Jr.

For Secretary—Thomas J. Kirwin

For Advisory Committee:

- To serve one year: Henry G. Bugbee
- To serve two years: Edward L. Keyes
- To serve three years: Joseph F. McCarthy
- To serve four years: Oswald S. Lowsley
- To serve five years: J. Sturdivant Read

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, May 17, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - 1. Arthrodesis for paralytic flail-wrist, Sigmund Epstein
 - 2. Cases of traumatic dislocation of the hip, I. Zadek
 - 3. Fusion of the arthritic knee by intra-articular bonegrafts, Dexter D. Ashley
- III. PAPERS OF THE EVENING
 - 1. Painful feet, Robert E. Humphries
 - 2. Traumatic spondylitis, Edgar D. Oppenheimer
- IV. EXECUTIVE SESSION
 - Election of Officers:
 - For Chairman—Armitage Whitman
 - For Secretary—Alan DeF. Smith
 - For Advisory Committee:
 - To serve one year: Elmer P. Weigel
 - To serve two years: Arthur Krida
 - To serve three years: Samuel Kleinberg
 - To serve four years: Mather Cleveland
 - To serve five years: Edgar D. Oppenheimer

SECTION OF OPHTHALMOLOGY

Monday Evening, May 20, at 8:00 o'clock

(Please Note Change of Hour)

ORDER

- I. READING OF THE MINUTES
- II. CLINICAL CASES
 - a. Acne rosacea keratitis, Raymond E. Meek, discussed by Elbert S. Sherman
 - b. Prolapse of lacrymal gland, James W. Smith, discussed by Arnold Knapp
 - c. Contraction of the orbit as a result of an undeveloped globe, Henry H. Tyson
- III. DEMONSTRATION
 - a. Quadrigeminate plate tumors—their clinical and anatomical features (lantern slides), Joseph H. Globus
 - b. Various types of ophthalmic lens corrections, Max Poser (by invitation)
 - c. Eccentric pupils, Arthur Knapp (by invitation)

IV. PAPERS OF THE EVENING

- a. Eye manifestations in fractures of the skull, George A. Blakeslee
(by invitation), discussed by Ernst Waldstein, Thomas H. Johnson
- b. General consideration of the eye in diabetes mellitus, Martin Cohen
- c. Blue sclerotics, Arthur Knapp (by invitation)

V. EXECUTIVE SESSION

Election of Officers

For Chairman—Ernest F. Krug

For Secretary—William F. C. Steinbugler

For Advisory Committee:

John M. Wheeler

Bernard Samuels

Thomas H. Curtin

Arnold Knapp

Edgar S. Thomson

SECTION OF MEDICINE

Tuesday Evening, May 21, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. The specific dynamic action of protein in the obese, Harry James Spencer
- b. Induction of active immunity during the course of lobar pneumonia,
Alvin Barach
- c. Liver fractions in pernicious anemia, Randolph West
- d. Sensitiveness to pain as modifying the interpretation of abdominal
symptoms, Burrill B. Crohn
- e. The treatment of glomerular nephritis, Thomas Addis, Prof. of
Medicine, Stanford University (by invitation)

II. EXECUTIVE SESSION

Election of Officers:

For Chairman—James Ralph Scott

For Secretary—Arthur H. Terry, Jr.

For Advisory Committee:

Eugene F. DuBois

B. S. Oppenheimer

Edgar Stillman

Homer F. Smith

John Wyckoff

SECTION OF LARYNGOLOGY AND RHINOLOGY

Monday Evening, May 27, at 8:15 o'clock

(Please Note Change of Date and Hour)

PAST-CHAIRMAN NIGHT AND ROUND-TABLE CONFERENCE

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Bronchoscopy and esophagoscopy, C. J. Imperatori

- b. Cancer of the larynx, John E. Mackenty
 - c. Sinusitis in children, Samuel McCullagh
 - d. Obscure sinus diagnosis, E. Ross Faulkner
 - e. Diphtheria—some complications and sequelae, Francis W. White
 - f. Classification of Fellows of the Section, Thomas J. Harris
 - g. Tonsillectomy in adults; local vs. general anaesthesia, Harmon Smith
 - h. Some of the uses of endothermy in the treatment of the nose and throat, Lee M. Hurd
- (Questions may be submitted before or during the Conference)

III. EXECUTIVE SESSION

Election of Officers

For Chairman—M. C. Myerson

For Secretary—John M. Loré

For Advisory Committee:

To serve one year: Samuel McCullagh

To serve two years: Henry Hall Forbes

To serve three years: Thomas J. Harris

To serve four years: D. Bryson Delavan

To serve five years: Cornelius G. Coakley

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, May 28, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES ..

Malignant transformation of uterine polyposis with pulmonary metastasis, Walter T. Dannreuther

Discussion, Nicholas M. Alter (by invitation), William P. Healy

III. PAPERS OF THE EVENING

Efficiency of medical diathermy in gynecology, Frank M. Ende

Discussion, Edward W. Pinkham

The Aschheim-Zondek test for diagnosis of pregnancy, Alfred Plaut.
Grete Stohr (by invitation)

Discussion, Robert Tilden Frank

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Election of Officers:

For Chairman—Edwin G. Langrock

For Secretary—David N. Barrows

For Advisory Committee:

To serve one year: Louis J. Ladin

To serve two years: George L. Brodhead

To serve three years: Frederick C. Holden

To serve four years: William P. Healy

To serve five years: Reginald M. Rawls

ACTION OF THE COUNCIL

The following minute and resolution were adopted May 22, 1929, on the retirement of Mrs. Laura E. Smith:

Mrs. Laura E. Smith began her work in the Library of The New York Academy of Medicine in January, 1891, as a general library worker. At a period when the Library was small and there was no real division of labor, Mrs. Smith rapidly learned the needs of the readers and became of the greatest assistance to them as a Reference Librarian. For a number of years her work included reference work, cataloging, bibliography and supervision. As the work enlarged, Mrs. Smith's services became more and more valuable to the Fellows in the Library and the readers depended more and more upon her judgment.

During the latter period of the incumbency of our former Librarian, Mr. John S. Brownne, Mrs. Smith, as Assistant Librarian, bore a continuing larger share of the burden of administering the Library and upon his retirement in 1925 was appointed Acting Librarian. Until the appointment of Dr. Malloch, she carried on the work with thoroughness and efficiency.

Mrs. Smith has devoted thirty-eight years of the most loyal and efficient service to the Library of The New York Academy of Medicine. Her rare devotion, interest and enthusiasm has to a large degree developed the esprit-de-corps of the Library staff and has contributed in a very large measure to the development of the Library. Be it therefore

Resolved, that the Council of The New York Academy of Medicine expresses to Mrs. Laura E. Smith its most hearty appreciation of the valuable services which she has rendered to the Library and to The New York Academy of Medicine and its very best wishes for her continued health and happiness during the years to come.

 FELLOWS ELECTED MAY 2, 1929

Charles Wise Byrd.....	8 East 54th Street
Max Cutler.....	27 West 96th Street
Beeckman J. Delatour.....	64 East 91st Street
Alphonse Raymond Dochez.....	136 East 67th Street
Alfred Elias Fischer.....	27 West 72nd Street
Albert Martin Judd.....	142 Joralemon St., Brooklyn
Robert F. Loeb.....	115 East 82nd Street
Floyd C. McDaniel.....	152 West 58th Street
Michael W. Mettenleiter.....	64 East 86th Street

DEATHS OF FELLOWS OF THE ACADEMY

JOHN ALFRED MANDEL, Sc., D., 496 Warburton Avenue, Yonkers, New York; graduated from New York University, New York City, in 1901; elected an Associate Fellow of the Academy January 5, 1905; died, May 5, 1929. Professor Mandel taught chemistry at New York University and Bellevue Hospital Medical College.

HERBERT EDMUND SMYTH, M.D., 476 John Street, Bridgeport, Connecticut; graduated in medicine from McGill University, Montreal, Canada, in 1884; elected a Fellow of the Academy December 4, 1902; died, May 19, 1929.

REGINALD HALL SAYRE, M.D., 1014 Madison Avenue, New York City; graduated in medicine from Bellevue Hospital Medical College, New York City, in 1884; elected a Fellow of the Academy October 6, 1887; died, May 29, 1929. He was a Fellow of the American Medical Association and of the American College of Surgeons. Dr. Sayre was a member of the County and State Society, the American Orthopedic Society, the Pathological Society, the Society of Alumni of Bellevue Hospital, Consulting Surgeon to the Hospital for Joint Diseases, State Orthopedic, Hackensack; Crippled Children, Newark, New Jersey; Mountainside, Montclair, Englewood and Flushing Hospitals; Assistant Surgeon to Bellevue Hospital, and Consulting Orthopedic Surgeon to St. Vincents Hospital.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V

JULY, 1929

No. 7

ANNIVERSARY DISCOURSE WHAT MEDICINE CAN DO FOR LAW *

BENJAMIN CARDOZO
Chief Judge of the Court of Appeals

There are those who say that the earliest physician was the priest, just as the earliest judge was the ruler who uttered the divine command and was king and priest combined. Modern scholarship warns us to swallow with a grain of salt these sweeping generalities, yet they have at least a core of truth. Our professions—yours and mine—medicine and law—have divided with the years, yet they were not far apart at the beginning. There hovered over each the nimbus of a tutelage that was supernatural, if not divine. To this day each retains for the other a trace of the thaumaturgic quality distinctive of its origin. The physician is still the wonder-worker, the soothsayer, to whose reading of the entrails we resort when hard beset. We may scoff at him in health, but we send for him in pain. The judge, if you fall into his clutches, is still the Themis of the Greeks, announcing mystic dooms. You may not understand his words, but their effects you can be made to feel. Each of us is thus a man of mystery to the other, a power to be propitiated in proportion to the element within it that is mystic or unknown. “Speak not ill of a great enemy,” says Selden in his *Table-Talk*—and Selden, you must know, was one of the ancient sages of our law—“speak not ill of a great enemy, but rather give him good words that he may use you the better if you

*Delivered before The New York Academy of Medicine, November 1, 1928.

chance to fall into his hands. The Spaniard did this when he was dying; his confessor told him, to work him to repentance, how the Devil tormented the wicked that went to hell; the Spaniard replying called the Devil my Lord; I hope my Lord the Devil is not so cruel. His confessor reproved him; excuse me for calling him so, says the Don, I know not into what hands I may fall, and if I happen into his, I hope he will use me the better for giving him good words." So with judges and doctors and devils it is all one, at least in hours of extremity.

One of these hours of extremity is at hand, the hour for the delivery of an anniversary address. The president of your Academy, moved I know not by what impulse—perhaps by some such faint foreboding as shaped the words of the Don in addressing his confessor—has turned with fair and soft speech to one without the mystic guild and has called upon a judge to preach the lesson of the hour. This is extraordinary enough, yet still more extraordinary is the fact that the judge has responded to the summons. In thus responding he has not been beguiled into the vain belief that any message he has to offer is worthy of your patience. He disclaims even a faint foreboding that there is need to propitiate your favor as against some future hour when he may be driven to seek your ministrations in default of other aid. Nothing is there on his side except a gesture of mere friendliness, the friendliness that is due between groups united in a common quest, the quest for the rule of order, the rule of health and of disease, to which for individuals as for society we give the name of law.

Indeed, the more I think it over, the more I feel the closeness of the tie that binds our guilds together. In all this there is nothing strange. I was reading the other day a very interesting document, a report to the overseers of Harvard University by the president of the university, Dr. A. Lawrence Lowell. He speaks of a new educational concept, the concept, as he calls it, of the continuity of knowledge. The idea is taking root that the subdivisions

of science, like those of time itself, have been treated too often as absolute and genuine—that there is need to recognize them more fully as mere figments of the brain, mere labor-saving devices, helps to thinking, but like other helps to thinking, misleading if their origin is neglected or forgotten. Thus it is that the physicist is learning from the chemist, the zoologist from the botanist, the economist from the statesman and the student of social science, the physician from the psychologist, and so on interchangeably and indefinitely. “The sharp severance,” we are told, “is giving way, and we perceive that all subjects pass imperceptibly into others previously distinct.” Something of this same concept of the continuity of knowledge is making its way into the law. In my own court at a recent session we had one case where a wise decision called for the wisdom of a chemist; another for that of one skilled in the science of mechanics; another for that of the student of biology and medicine; and so on through the list. I do not say we were able to supply this fund of wisdom out of the resources of our knowledge, yet in theory, at least, the litigants before us were entitled to expect it, and our efficiency as judges would be so much the greater, the quality of the output so much the sounder and richer, in proportion to our ability to make the theory one with fact. More and more we lawyers are awaking to a perception of the truth that what divides and distracts us in the solution of a legal problem is not so much uncertainty about the law as uncertainty about the facts—the facts which generate the law. Let the facts be known as they are, and the law will sprout from the seed and turn its branches toward the light. We make our blunders from time to time as rumor has it that you make your own. The worst of them would have been escaped if the facts had been disclosed to us before the ruling was declared. A statute of New York, forbidding night work for women, was declared arbitrary and void by a decision of the Court of Appeals announced in 1907 (*People vs. Williams*, 189 N. Y. 131). In 1915, with fuller knowledge of the investigations of scientists and social workers, a like statute was

held by the same court to be reasonable and valid (People vs. Schweinler Press, 214 N. Y. 395). "Courts know to-day" (if I may borrow my own words) "that statutes are to be viewed, not in isolation or *in vacuo*, as pronouncements of abstract principles for the guidance of an ideal community, but in the setting and the framework of present-day conditions as revealed by the labors of economists and students of the social sciences in our own country and abroad" (Cardozo, *The Nature of the Judicial Process*, p. 81).

Examples to point the meaning come flocking at the call. Again and again we are asked to nullify legislation as an undue encroachment upon the sphere of individual liberty. Encroachment to some extent there is by every command or prohibition. Liberty in the literal sense is impossible for anyone except the anarchist, and anarchy is not law, but its negation and destruction. What is undue in mandate or restraint cannot be known in advance of the event by a process of deduction from metaphysical principles of unvarying validity. It can be known only when there is knowledge of the mischief to be remedied, and knowledge of the mischief—to which, of course, must be added knowledge of the effectiveness of the remedy to counteract or cure the mischief—is knowledge of the facts. We do not turn to a body of esoteric legal doctrine, at least not invariably, to find the key to some novel problem of constitutional limitation, the bounds of permissible encroachment on liberty or property. We turn at times to physiology or embryology or chemistry or medicine—to a Jenner or a Pasteur or a Virchow or a Lister as freely and submissively as to a Blackstone or a Coke. Of course, even then we try to know our place and exhibit the humility that becomes the amateur. We do not assume to sit in judgment between conflicting schools of thought. Enough it is for us that the view embodied in a contested statute has at least respectable support—its sponsors, if perchance its critics—in the true abodes of science. Shall hours of labor be limited in one calling or another, for this group or for that? The physiologist as well as the sociologist must

supply us with the body of knowledge appropriate to the problem to be solved. Such cases as *People vs. The Schweinler Press*, (214 N. Y. 395), decided by the Court of Appeals of New York in 1915, and *Muller vs. Oregon*, (208 U. S. 412), decided in 1908 by the Supreme Court of the United States, show the answer of the courts when the enlightening facts were put before them by workers in other fields. Shall compulsory vaccination be exacted of the children in the public schools? Read the answer of the courts in *Matter of Viemeister*, (179 N. Y. 235), decided in 1904, and *Jacobson vs. Massachusetts*, (197 U. S. 11), decided a year later. Only the other day my court had to deal with the propriety of the tuberculin test as applied to herds of cattle, the unfortunates who responded to the test being marked for quarantine or slaughter (*People vs. Teuscher*, July, 1928, 248 N. Y. 454). A question of scientific fact is at the core of other problems, juridical in form, and yet intense, or so I hear, in their emotional appeal. What is a beverage, and when is it intoxicating? Let me not open ancient wounds by a reminder of the answer.

We look then to you, to the students of mind and body, for the nutriment of fact, solid if not liquid, that in many a trying hour will give vitality and vigor to the tissues of our law. Conspicuously is this true to-day in the administration of the law of crime. The law of crime has dramatic features which make it bulk large in the public mind, though of all the cases in my court the criminal appeals make up a small proportion, say eight or ten per cent. None the less, from the viewpoint of its social consequences the criminal law has an importance that is imperfectly reflected in statistical averages or the tables of accountants. The field is one in which the physician is asserting himself year by year with steadily expanding power. Among students of criminology there are now many who maintain that the whole business of sentencing criminals should be taken away from the judges and given over to the doctors. Courts, with their judges and juries, are to find the fact of guilt or innocence. The fact being ascertained, the

physician is to take the prisoner in hand and say what shall be done with him. Governor Smith in his message to the Legislature of 1928 recommended that this reform be studied by the Crime Commission. "Because," he said, "of my belief that justice sometimes miscarries because those charged with determining guilt are often affected by the thought of the sentence to be imposed for a given crime, I would suggest that the Crime Commission give careful study and consideration to a fundamental change in the method of sentencing criminals. After guilt has been determined by legal process, instead of sentence being fixed by judges according to statute, I should like to see offenders who have been adjudged guilty detained by the state. They should then be carefully studied by a board of expert mental and physical specialists, who after careful study of all the elements entering each case would decide and fix the penalty for the crime. I realize the complexity of such a fundamental change. It probably requires even constitutional amendment. Therefore I recommend that your honorable bodies request the Crime Commission to report to you, after due and careful study of the proposal, whether such a change is advisable and how it can be brought about. It appeals to me as a modern, humane, scientific way to deal with the criminal offender."

The reform thus proposed is no extemporized nostrum, no hasty innovation. It was recommended not many years ago by a committee of the Institute of Criminal Law and Criminology, of which the chairman was Victor P. Arnold, judge of the Juvenile Court of Chicago. This committee proposed *inter alia* "that in all cases of felony or misdemeanors punishable by a prison sentence the question of responsibility be not submitted to the jury, which will thus be called upon to determine only that the offense was committed by the defendant," and "that the disposition and treatment (including punishment) of all such misdemeanants and felons—*i.e.*, the sentence imposed, be based upon a study of the individual offender by properly qualified and impartial experts coöperating with the courts" (10 *Journal Criminal Law and Criminology*, p. 186;

Glueck, *Mental Disorder and the Criminal Law*, p. 455). One of the most careful studies of the crime problem in recent years is that of Dr. S. Sheldon Glueck in his work on *Mental Disorder and the Criminal Law*. "If," he says (pp. 485, 486), "the socio-legal treatment of *all* criminals regardless of pathological condition, were being considered, it would seem that the simplest device would be to permit the law to convict or acquit as is done to-day, but to provide for an *administrative* instrumentality (perhaps a commission composed of psychiatrists, psychologists, sociologists, and others) to begin to function in case of convicted persons at the point where the law leaves off, to determine the appropriate socio-penal treatment adequate to the individual delinquent, as well as its duration." Developing this thought in an interesting essay, "A Rational Penal Code," published in the *Harvard Law Review*, (41 *Harvard Law Review* 453), he puts forward the view that the minimum sentence should be fixed by law, but that the maximum in every instance should be left indefinite, to be determined for the individual prisoner by psychiatrists and physicians after a study of the individual case (cf. Gillin, *Criminology and Penology*, p. 153). Even now in some of the countries of continental Europe—in Switzerland, for example—a criminal whose mentality is low, though insanity is not suspected, is turned over for examination to psychiatrists in the service of the government, who make their recommendations to the court before sentence is pronounced.¹

Not a little impetus has been given to these and like reforms by researches of bio-chemists into the operations of the ductless glands. If most of their conclusions are still in the stage of speculation or hypothesis, their writings have been useful, none the less, in awaking popular

¹ (Cf. the recent statute of Massachusetts, 1. 1927, c. 59, which calls for an examination by psychiatrists of any person indicted for a capital offense or any person indicted for another offense after an earlier conviction for a felony. Such a statute will do much to remove the reproach that has attached so long and so persistently to the testimony of experts; see 13 *Mass. Law Quarterly*, p. 38, *et seq.*, No. 6, August, 1928.)

interest in the mentality of criminals, bringing home the need of study and the possibilities of a reformed penology to many who were blissfully unconscious of the existence of a problem. Our vices as well as our virtues have been imputed to bodily derangements till character has become identified with a chemical reaction. "The internal secretions," says an enthusiastic student of the endocrines (Berman, *The Glands Regulating Personality*, p. 22), "the internal secretions with their influence upon brain and nervous system, as well as every other part of the body-corporation, as essentially blood-circulating chemical substances, have been discovered the real governors and arbiters of instincts and dispositions, emotions and reactions, characters and temperaments, good and bad." A far cry is this from the voice of Socrates in the *Republic* of Plato: "My belief is, not that a good body will by its own excellence make the soul good; but, on the contrary, that a good soul will by its excellence render the body as perfect as it can be." The criminal of old was given copious draughts of exhortation and homily administered with solemn mien by reformers lay and cleric. The criminal of tomorrow will have fewer homilies and exhortations, but will have his doses of thyroxin or adrenalin till his being is transfigured. Good people sitting peacefully in their homes and reading fearsome tales of robbery and rapine, may take comfort in the thought that while the generation of character is in this process of "becoming," the body of the offender will be in the keeping of the law.

I have no thought in all this to express approval or disapproval of the project of withdrawing from the court the sentence-fixing power. One may see a wise reform there without acceptance of the creed that virtue and vice are not spiritual essences, but high-sounding synonyms for the hormones of the body. As to this last many of us, perhaps in our ignorance, will feel like echoing the words of Principal Jacks in his suggestive little book, *Constructive Citizenship*. "I think also," he says, "that while most of us are content to have our vices (but not our virtues) explained in this charitable manner by our neighbors, very

few of us, and those the meanest, are in the habit of applying it to themselves. When we apply it to ourselves, a voice within seems to answer 'It is false.' " He is speaking, as it happens, of another and earlier precept of criminology, the precept that virtue and vice are the products solely of environment; but his words are as apposite to the notion that they are the products chiefly of the glands, though in each case it is true that repugnance must not be taken as amounting to disproof. All this, however, is beside the mark, at least for present purposes. Like the neophytes of other faiths, the discoverers of the new theory that virtue and vice are synonyms for spontaneous secretions may have overshot the mark, may have loaded a useful notion with more than it can bear. To prove that genius is accompanied by certain bodily changes or reactions is not to prove that the bodily changes or reactions are identical with genius (cf. Bertrand Russell, *Philosophy*, p. 218). This does not detract from the fullness of my belief that at a day not far remote the teachings of bio-chemists and behaviorists, of psychiatrists and penologists, will transform our whole system of punishment for crime. Vain is the attempt to forecast here and now the lines of the transfigured structure. We must keep a sharp lookout, or you will supplant us altogether. Do they not tell the fable of Hippocrates that he burned the library of the Temple of Health at Cnidos in order to enjoy a monopoly of knowledge? How it will work out, whether we shall sit beside you or above you, or even perhaps below you, I am not wise enough to say. The physician may be merely the ally of the judge in the business of admeasuring the sentence, or, as to that branch of the work, may even drive the judge away. Detention of the offender may retain in respect of certain crimes the qualities, or some of them, belonging to our present system of imprisonment, and for other crimes may acquire a quality less punitive and rigorous. But transformation there will be.

For the present system is stern often when it should be mild, and mild often when it should be stern, or so, at least, its critics urge. It is a survival of the time when punish-

ment for crime was thought of as a substitute for private vengeance, with its sequel private war. The familiar phrase, the King's Peace, means this and nothing more, that for the peace separately maintained by duke or count or bishop, each in his own domain, there was to be substituted one general or uniform peace, the king's, establishing a single rule throughout the kingdom far and wide. You will find it all set forth by Sir Frederick Pollock in one of his fascinating essays with the fullness of example that is dear to antiquarians (Pollock, Oxford Lectures, *The King's Peace*, p. 64). We have put away the blood feud, the vendetta, the other forms of private war, but in the framing of our penal codes we have not forgotten the passions that had their outlet and release in pursuit and retribution. I do not say that it is wise to forget them altogether. The thirst for vengeance is a very real, even if it be a hideous, thing; and states may not ignore it till humanity has been raised to greater heights than any that have yet been scaled in all the long ages of struggle and ascent. Disregard such passions altogether, and the alternative may be the recrudescence of the duel or the feud. The vigilance committee and Judge Lynch may shove aside police and courts. Even if vengeance be forgotten and the social consequences alone considered, there are inhibitions in the threat of punishment that society cannot afford to withdraw from any capable of feeling them. "The presence of mechanism," says Dr. Glueck (*op cit.*, p. 444), "does not mean that human beings have not some spark of capacity for consciously and creatively guiding their conduct in conforming with legal sanctions." Punishment is necessary, indeed, not only to deter the man who is a criminal at heart, who has felt the criminal impulse, who is on the brink of indecision, but also to deter others who in our existing social organization have never felt the criminal impulse and shrink from crime in horror. Most of us have such a scorn and loathing of robbery or forgery that the temptation to rob or forge is never within the range of choice; it is never a real alternative. There can be little doubt, however, that some of this repugnance is due

to the ignominy that has been attached to these and like offenses through the sanctions of the criminal law. If the ignominy were withdrawn, the horror might be dimmed.

All this I have in mind, yet even so, the present system, in the view of many, is as irrational in its mercies as in its rigors, and in its rigors as in its mercies. The casual offender expiates his offense in the company of defectives and recidivists, and after devastating years is given back an outcast to the society that made him. The defective or recidivist, whose redemption is hopeless, goes back after a like term, or one not greatly different, to renew his life of crime, unable to escape it without escaping from himself. Students of the mind and body are insisting, as never before, that in much of our criminology there is futility and waste. "It is foolish," says one of them, "to build institutions for detaining defectives for long periods as a punishment for a condition for which they are not responsible, and then discharge them without doing anything to remove the cause of their trouble." "For a large proportion of criminals," says another author, "—the percentage has yet to be determined—punishment for a period of time and then letting him go free is like imprisoning a diphtheria-carrier for awhile and then permitting him to commingle with his fellows and spread the germ of diphtheria" (S. W. Bandler, *The Endocrines*, p. 266; Berman, *The Glands Regulating Personality*, p. 310; Schlapp and Smith, *The New Criminology*, p. 270). A beginning of a change has been made in this state by recent legislation, but with tests, in the thought of many, too mechanical and absolute. Not improbably the path of progress has been marked in an English statute which supplements the term of punishment in prison with another and elastic term of what is known as preventive detention in less rigorous surroundings, a camp in the Isle of Wight being set aside for that use (Gillin, *Criminology and Penology*, p. 412; Preventive of Crime Act, 8 Edw. 7 c. 59; Halsbury Laws of England,

Title Crim. L., § 796).¹ Here or in some system not dissimilar may be found the needed adjustment between the penal and the remedial elements in our scheme of criminology.

Adjustment of some sort there must be if we are to fill the measure of our duty to our defective fellow beings. Run your eyes over the life history of a man sentenced to the chair. There, spread before you in all its inevitable sequence, is a story of the Rake's Progress more implacable than any that was ever painted by a Hogarth. The Correctional School, the Reformatory, Sing Sing or Dannemora, and then at last the chair. The heavy hand of doom was on his head from the beginning. The sin, in truth, is ours—the sin of a penal system that leaves the victim to his fate when the course that he is going is written down so plainly in the files of the courts and the stigmata of mind and body. I do not mean to say that any rule of thumb is to be adopted in dealing with these problems. My experience as a judge in other fields of law has made me distrustful of rules of thumb generally. They are a lazy man's expedient for ridding himself of the trouble of thinking and deciding. Try hard as we will, the problems of punishment, like the problems of law generally, are in their essence unique. "We must spread the gospel," writes Professor Powell, "we must spread the gospel that there is no gospel that will save us from the pain of choosing at every step." Human nature, like human life, has complexities and diversities too many and too intricate to be compressed within a formula. I would not shut the door of hope on anyone, though classified in some statistical table as defective or recidivist, so long as scientific analysis and study of his mental and physical reactions after the

¹ On the same lines a recent amendment of the Prison Law of New York permits the detention of mental defectives at the State Institution at Napanoch after sentence has expired (Prison Law, §§ 467, 470; Laws of 1927, chap. 426), but the term mental defectives as used in the statute (Mental Hygiene Law, § 136) embraces a narrower class than the same term is meant to embrace as it is used in this address. Very likely an extension of these provisions to prisoners of other types may be expected in the future.

state had taken him in hand held out the promise of redemption. Neither in punishment nor in any other form of judging shall we ever rid ourselves altogether of the heart-breaking burden of individual adjustment.

I do not say that either psychology or medicine or penology has yet arrived at such a stage as to make a revolution in our system of punishment advisable or possible. Here as in so many fields we shall have to feel our way, it may be, by slow advances, by almost insensible approaches. I have faith, none the less, that a century or less from now, our descendants will look back upon the penal system of to-day with the same surprise and horror that fill our own minds when we are told that only about a century ago one hundred and sixty crimes were visited under English law with the punishment of death, and that in 1801 a child of thirteen was hanged at Tyburn for the larceny of a spoon (4 Blackstone, Comm. 18; cf. however, 1 Stephen, *History of the Criminal Law of England* 470). Dark chapters are these in the history of law. We think of them with a shudder, and say to ourselves that we have risen to heights of mercy and of reason far removed from such enormities. The future may judge us less leniently than we choose to judge ourselves (cf. Jung, *Das Problem des Natürlichen Rechts*, p. 74). Perhaps the whole business of the retention of the death penalty will seem to the next generation, as it seems to many even now, an anachronism too discordant to be suffered, mocking with grim reproach all our clamorous professions of the sanctity of life. Perhaps some new Howard will make us see in our whole prison system a reproach as great, a blot as dark, as the Howard of English history made visible to the eyes of all in the prisons and pest houses of a century and a half ago. I am not sure how this will be. Sure, however, I am that whatever enlightenment shall come will make its way, not through the unaided labors of the men of my profession, the judges and the advocates, but through the combined labors of men of many callings, and most of all your own. How quickly a great change can come about will be seen if we contrast the penal justice applied to

children a quarter-century ago with the treatment in these days of the juvenile delinquent by the judges of the Children's Courts. You will find it all set forth in a recent study of Juvenile Courts in the United States by Dr. Herbert H. Lou in the Social Study Series of the University of North Carolina. The methods, the humane and scientific methods, that have thus prevailed will spread to other fields. This is your work, I am persuaded, as much as it is ours. Your hands must hold the torch that will explore the dark mystery of crime—the mystery, even darker, of the criminal himself, in all the deep recesses of thought and will and body. Here is a common ground, a borderland between your labors and our own, where hope and faith and love can do their deathless work.

One takes a large order when one offers to reshape from its foundations a scheme of penal justice. Those of us whose course has even now been largely run, may wish to have before us a prospect less Utopian. Let me call attention, therefore, to two features of the law of crimes where the coöperation of your profession will be helpful even now without wreaking our energies upon reforms that will flower at some distant day. I think the men of your Academy might well emphasize the need for a restatement of our law of homicide, and in particular of the distinction between murder in its two degrees. I think they might well emphasize another subject—one that has grown a trifle stale, but never to be abandoned till it has been settled right—the definition of insanity when viewed as an excuse for crime.

The law of homicide, and in particular the distinction between murder in the first and second degrees, may seem at first blush to be something that involves the mere technique of criminal law, and so a matter not for you, but one to be dealt with by the lawyers. The reason why I mention it to you is because the anomalies of the present distinction can be developed with special clearness and authority by the psychiatrist or the alienist or the student of psychology.

Homicide under our statute is classified as murder and as manslaughter, and murder itself has two degrees, a first and a second. "The killing of a human being, unless it is excusable or justifiable, is murder in the first degree when committed from a deliberate and premeditated design to effect the death of the person killed, or of another," as well as in certain other situations which, for the purpose of my present inquiry, it is not important to consider (Penal Law, § 1044). "Such killing of a human being is murder in the second degree, when committed with a design to effect the death of the person killed or of another, but without deliberation and premeditation" (Penal Law, § 1046). There, you see, is the distinction, and it is at least verbally clear. Both first and second degree murder (laying aside the exceptions which I thought it unnecessary to state) require an intent to kill, but in the one instance it is deliberate and premeditated intent, and in the other it is not. If there is no intent to kill whatever, the grade (subject to exceptions) is reduced to manslaughter. I have said that on the face of the statute the distinction is clear enough. The difficulty arises when we try to discover what is meant by the words deliberate and premeditated. A long series of decisions, beginning many years ago, has given to these words a meaning that differs to some extent from the one revealed upon the surface. To deliberate and premeditate within the meaning of the statute, one does not have to plan the murder days or hours or even minutes in advance, as where one lies in wait for one's enemy or places poison in his food and drink. The law does not say that any particular length of time must intervene between the volition and the act. The human brain, we are reminded (*People vs. Majone* 91 N. Y. 211), acts at times with extraordinary celerity. All that the statute requires is that the act must not be the result of immediate or spontaneous impulse. "If there is hesitation or doubt to be overcome, a choice made as the result of thought, however short the struggle between the intention and the act," there is such deliberation and premeditation as will expose the offender to the punishment of death

(*People vs. Leighton*, 88 N. Y. 117). Thus in a case decided in 1886 (*People vs. Beckwith*, 103 N. Y. 360), the defendant ejected a trespasser; a fight ensued; the defendant stabbed the trespasser and flung him to the ground; having done this, he seized an axe and clove the victim's head. The interval between the knife blow and the falling axe was long enough to sustain the verdict that sent the murderer to his death. One may say indeed in a rough way that an intent to kill is always deliberate and premeditated within the meaning of the law unless the mind is so blinded by pain or rage as to make the act little more than an automatic or spontaneous reaction to the environment—not strictly automatic or spontaneous, for there could then be no intent, and yet a near approach thereto. The behaviorists would say, I suppose, that what had happened was a conditioned reflex, a learned, as opposed to an unlearned response (Watson, *Behaviorism*, p. 103, and cf. B. Russell, *Philosophy*, p. 21). Courts in other states (*e.g.*, Massachusetts), lay down the same rules or rules not greatly different.

I think the distinction is much too vague to be continued in our law. There can be no intent unless there is a choice, yet by the hypothesis, the choice without more is enough to justify the inference that the intent was deliberate and premeditated. The presence of a sudden impulse is said to mark the dividing line, but how can an impulse be anything but sudden when the time for its formation is measured by the lapse of seconds? Yet the decisions are to the effect that seconds may be enough. What is meant, as I understand it, is that the impulse must be the product of an emotion or passion so swift and overmastering as to sweep the mind from its moorings. A metaphor, however, is, to say the least, a shifting test whereby to measure degrees of guilt that mean the difference between life and death. I think the students of the mind should make it clear to the lawmakers that the statute is framed along the lines of a defective and unreal psychology. If intent is deliberate and premeditated whenever there is choice, then in truth it is always deliberate and premeditated, since

choice is involved in the hypothesis of the intent. What we have is merely a privilege offered to the jury to find the lesser degree when the suddenness of the intent, the vehemence of the passion, seems to call irresistibly for the exercise of mercy. I have no objection to giving them this dispensing power, but it should be given to them directly and not in a mystifying cloud of words. The present distinction is so obscure that no jury hearing it for the first time can fairly be expected to assimilate and understand it. I am not at all sure that I understand it myself after trying to apply it for many years and after diligent study of what has been written in the books. Upon the basis of this fine distinction with its obscure and mystifying psychology, scores of men have gone to their death. I think it is time for you who speak with authority as to the life of the mind to say whether the distinction has such substance and soundness that it should be permitted to survive. Some appropriate committee there should be in the bar associations, on the one hand, and this Academy, on the other (if none exists already), whereby the resources of the two professions can be pooled in matters such as these where society has so much to gain from co-operative endeavor.

I have spoken of another branch of the law of homicide, the law defining and governing mental irresponsibility. In strictness, this is not a branch of the law of homicide alone, since the same definition applies to other crimes as well, yet it is in connection with homicide that the question commonly arises. In the early stages of our law, way back in mediæval times, insanity was never a defense for crime. The insane killer, like the man who killed in self-defense, might seek a pardon from the king, and would often get one. He had no defense at law. Gradually there came in the law itself a mitigation of this rigor. A defense of insanity was allowed, but only within the narrowest limits. This was what has become known as the wild-beast stage of the defense. The killer was not excused unless he had so lost his mind as to be no more capable of understanding than if he were merely a wild beast. Then the limits of

the defense were expanded, but still slowly and narrowly. The killer was excused if the disease of the mind was such that he was incapable of appreciating the difference between right and wrong. At first this meant, not the right and wrong of the particular case, but right and wrong generally or in the abstract, the difference, as it was sometimes said, between good and evil. Later the rule was modified in favor of the prisoner so that capacity to distinguish between right and wrong generally would not charge with responsibility if there was not capacity to understand the difference in relation to the particular act, the subject of the crime. The rule governing the subject was crystallized in England in 1843 by the answer made by the House of Lords to questions submitted by the judges in the famous case of *McNaghten*, who was tried for the murder of one Drummond, the secretary of Sir Robert Peel. The answer was in effect that "the jurors ought to be told in all cases that every man is to be presumed to be sane, and to possess a sufficient degree of reason to be responsible for his crimes, until the contrary be proved to their satisfaction; and that to establish a defense on the ground of insanity it must be clearly proved that, at the time of committing the act, the accused was laboring under such a defect of reason from disease of the mind, as not to know the nature and quality of the act he was doing, or, if he did know it, that he did not know he was doing what was wrong" (*McNaghten's Case*, 10 Cl. & F. 200).

The test established by *McNaghten's Case* has been incorporated into the law of New York by the mandate of the statute. Penal Law, § 34, provides: "A person is not excused from criminal liability as an idiot, imbecile, lunatic or insane person, except upon proof that at the time of the commission of the alleged criminal act he was laboring under such a defect of reason as either (1) not to know the nature and quality of the act he was doing; (2) not to know the act was wrong." It matters not that some uncontrollable impulse, the product of mental disease, may have driven the defendant to the commission of the murderous act. The law knows nothing of such excuses

(*Flanagan vs. People*, 52 N. Y. 467; *People vs. Carpenter*, 102 N. Y. 238; *People vs. Taylor*, 138 N. Y. 398). Again the statute is explicit: "A morbid propensity to commit prohibited acts, existing in the mind of a person who is not shown to have been incapable of knowing the wrongfulness of such acts, forms no defense to a prosecution therefor" (Penal Law, § 34). If the offender knew the nature and quality of the act and knew it to be wrong, he must answer for it with his life, if death is the penalty that would be paid by the sane. Of course, there is an ambiguity in all this which will not have escaped your quick discernment. What is meant by knowledge that the act is wrong? Is it enough that there was knowledge that the act was wrong in the sense that it was prohibited by law, or must there be knowledge also that it was morally wrong? Curiously enough, this question did not arise in New York till 1915. One Schmidt, a priest, was charged with the murder of a woman with whom he had been intimate. Upon the trial his defense was insanity. He said he had heard the voice of God calling upon him by day and night to sacrifice and slay. He yielded to the call in the belief that slaughter was a moral duty. The trial judge held that this belief was no defense if he knew the nature of the act and knew it to be wrong in the sense of being prohibited by law. On appeal this ruling was reversed (*People vs. Schmidt*, 216 N. Y. 324). We held that the word "wrong" in the statutory definition had reference in such circumstances to the moral quality of the act, and not merely to the legal prohibition. Any other reading would charge a mother with the crime of murder if she were to slay a dearly loved child in the belief that a divine command had summoned to the gruesome act. Let me say by way of parenthesis that Schmidt did not profit by the error in the charge, since he admitted under oath that the whole defense of insanity was an imposture and a sham.

Physicians time and again rail at the courts for applying a test of mental responsibility so narrow and inadequate. There is no good in railing at us. You should rail at the legislature. The judges have no opinion in the matter.

They are bound, hand and foot, by the shackles of a statute. Everyone concedes that the present definition of insanity has little relation to the truths of mental life. There are times, of course, when a killing has occurred without knowledge by the killer of the nature of the act. A classic instance is the case of Mary Lamb, the sister of Charles Lamb, who killed her mother in delirium. There are times when there is no knowledge that the act is wrong, as when a mother offers up her child as a sacrifice to God. But after all, these are rare instances of the workings of a mind deranged. They exclude many instances of the commission of an act under the compulsion of disease, the countless instances for example, of crimes by paranoiacs under the impulse of a fixed idea. I am not unmindful of the difficulty of framing a definition of insanity that will not be so broad as to open wide the door to evasion and imposture. Conceivably the law will have to say that the risk is too great, that the insane must answer with their lives, lest under cover of their privilege the impostor shall escape. Conceivably the twilight zone between sanity and insanity is so broad and so vague as to bid defiance to exact description. I do not know, though I am reluctant to concede that science is so impotent. Attempts at formulation of a governing principle or standard have been none too encouraging (Glueck, *op. cit.*, pp. 452, 459), but betterment is attainable, though it be something less than perfection. Many states—Massachusetts, for example, and Alabama and Pennsylvania and Virginia and Vermont—recognize the fact that insanity may find expression in an irresistible impulse, yet I am not aware that the administration of their criminal law has suffered as a consequence (see, *e.g.*, *Commonwealth vs. Cooper*, 219 Mass. 1; *Parsons vs. State*, 81 Ala. 577; *Commonwealth vs. DeMarzo*, 223 Pa. St. 573; *State vs. Dejarnette*, 75 Va. 867; *Doherty vs. State*, 73 Vt. 380). Much of the danger might be obviated if the issue of insanity were triable by a specially constituted tribunal rather than the usual jury. Of this at least I am persuaded: the medical profession of the state, the students of the life of the mind in health and in disease,

should combine with students of the law in a scientific and deliberate effort to frame a definition, and a system of administration, that will combine efficiency with truth. If insanity is not to be a defense, let us say so frankly and even brutally, but let us not mock ourselves with a definition that palters with reality. Such a method is neither good morals nor good science nor good law. I know it is often said, and very likely with technical correctness, (see *e.g.*, Oppenheimer, *Criminal Responsibility of Lunatics*, p. 247; Stephen, *Digest of Criminal Law*, Art. 29; Glueck, *op. cit.*, p. 43), that the statute ought not to be viewed as defining insanity. What it does, and all that it does is to state the forms or phases of insanity that will bring immunity from punishment. All this may be true, yet it is hard to read the statute without feeling that by implication and suggestion it offers something more. It keeps the word of promise to the ear and breaks it to the hope. Let us try to improve its science and at the very least its candor. Here is another field for the coöperative endeavor of medicine and law.

Every now and then there crops up in popular journals a discussion of the problem of euthanasia. The query is propounded whether the privilege should be accorded to a physician of putting a patient painlessly out of the world when there is incurable disease, agonizing suffering, and a request by the sufferer for merciful release. No such privilege is known to our law, which shrinks from any abbreviation of the span of life, shaping its policy in that regard partly under the dominance of the precepts of religion and partly in the fear of error or abuse. Just as a life may not be shortened, so its value must be held as equal to that of any other, the mightiest or the lowliest. The mother will have the preference over an infant yet unborn, but from the moment of birth onward, human-kind, as the law views it, is a society of equals. I am sure that thoughts of this order must rise sometimes to your minds when you move along the wards of hospitals and see the forms of men and women—the ugly and the beautiful, the wise and the foolish, the young and the old, the gay

and the wretched—outstretched before you in the great democracy of suffering. You may find it of some interest to be told that the law has had to struggle with these problems and to know how it has resolved them. There are two classic cases—the case of the *U. S. vs. Holmes*, reported in 1 Wallace, Jr., 1; Federal cases No. 15,383, a trial in the United States Circuit Court for the Eastern District of Pennsylvania, and the case of the *Queen vs. Dudley*, reported in L. R. 14 Q. B. D. 273, a trial in the Court of Queen's Bench of England. The Holmes case has recently been revived with a full statement of the testimony, the arguments of counsel, and the charge of the court in a book by Frederick C. Hicks, to which he has given the title *Human Jettison*. Any of you who care to read it will find a human document of absorbing interest. Holmes was a seaman on a ship, the *William Brown*, which set sail from Liverpool for Philadelphia in 1841 with eighty-two souls aboard, seventeen officers and crew, and sixty-five passengers. Thirty-seven days out the ship struck an iceberg and sank. Two boats were lowered. One, the jolly, as it was called, bore the captain, two officers, six members of the crew, and one passenger. Six days later, just as the rations had given out, she was picked up and those aboard her saved. The other boat, styled the long one, in the charge of the first mate, had forty-two aboard, of whom thirty-three were passengers, the others crew. The long boat was long only by comparison with the other. She was overweighted with her human burden—men, women and children packed so close together in a boat already leaking that they could hardly move a limb. A squall came up the next day, and imminent was the danger that the boat would founder. The mate gave the order to jettison a portion of the human freight. Holmes and another carried out the mandate. Fourteen men were seized and, amid their protests and entreaties, were thrown over the side. Two women also were lost, but there is reason to believe that they jumped overboard of their own will, made desperate at the sight of the sacrifice of a brother. For the most part, however, the victims were the men. The boat,

relieved of this burden, rode the waves in safety. The following morning a sail was sighted. Quilts and blankets were waved and hoisted. There was an answer to the signal. The ship came up and the remnant on the boat were saved.

When the story of the sacrifice of sixteen souls became known to the world, there were many who drew back revolted and said that it was murder. The mate and most of the seamen disappeared when there was talk of an arrest. Holmes came to Philadelphia and was charged with homicide on the high seas, a crime under the federal law. The grand jury refused to indict for murder, but did indict for manslaughter. For this he was tried and convicted. He was sentenced to imprisonment for six months, having already served nine months before his conviction, and also to a fine, which, however, was afterward remitted. I think there is little, if any, doubt that he had acted in good faith, believing that all would be lost unless there was a sacrifice of some. His good faith did not purge him of the guilt of crime, though it called for mercy in the sentence. Where two or more are overtaken by a common disaster, there is no right on the part of one to save the lives of some by the killing of another. There is no rule of human jettison. Men there will often be who when told that their going will be the salvation of the remnant, will choose the nobler part and make the plunge into the waters. In that supreme moment the darkness for them will be illumined by the thought that those behind will ride to safety. If none of such mold are found aboard the boat, or too few to save the others, the human freight must be left to meet the chances of the waters. Who shall choose in such an hour between the victims and the saved? Who shall know when masts and sails of rescue may emerge out of the fog?

A score of years later a case not dissimilar was brought before an English court. Three men and a boy were adrift in a small boat. Two of the men, Dudley and Stephens, made desperate by hunger, killed the boy and ate his flesh. Four days later they were picked up by a passing vessel,

THE RÔLE OF THE MEDICAL EXPERT IN CRIMINAL TRIALS

FOSTER KENNEDY

(Delivered before The New York Academy of Medicine, March 7, 1929*)

Our forefathers fought for the recognition of individual rights; Runnymede and Magna Charta, The Bill of Rights, the Struggle with the Crown, the falling of the anointed Heads that wore them, the continuation of that struggle in America with the resounding victory of the people; the present day liberties of each of us have been bought by struggle and by sacrifice.

The Great War was in essence a fight for individualism against organized government as represented by Prussia. Concentration for centuries on liberty of the person as the one great objective worth fighting for has developed in us such an individual consciousness, such a respect for individual rights that we have rather lost sight of the rights of society as a whole. We have been so glamourised by our desire to safeguard personal freedom that we have been negligent of the safety of the majority.

Society, in short, in America is failing to protect itself against rampant individualism as represented by the gunman and the thug; during 1927 there were over eleven thousand homicides in this country, a fifth of the total loss of the American forces sustained through both natural causes and at the hands of the enemy in nineteen months of first class modern warfare.

The police force and the law courts are tardy instruments in the apprehension of the majority of those criminals, but when they have been apprehended, we medical men are often made another brake on the slow wheel of justice and are invited to abet the sentimentality of inferior minds by testifying in and out of season to the lack of responsibility of the criminal.

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Law is an instrument for the protection of Society. Medicine has been in the past century an instrument for the protection of the individual. For twenty-five years, however, our Profession has had a new orientation; our greatest achievements have been towards prophylaxis and the maintenance of sound public health. The Doctors have conquered yellow fever, crippled malaria, set bounds to plague. We have wrested from nature whole continents for the White Races by the control of tropical disease. We built the Panama Canal, not the engineers. The French engineers knew how to cut the canal—for that matter so did the ancients in Corinth and earlier still in Suez—but they did not know how to cut their own mortality. When medicine found the way to that achievement, the task of the shovels was simple. The British lost 25,000 dead in the Boer War in 1900; of that number 5,000 were killed by the Boers, the rest died of typhoid. You know the proportion of American lives lost in 1898 to Spanish bullets and to Bacteria. Had our doctors not discovered how to deal with enteric in the ten or fifteen years following the Cuban and South African Wars, civilization would have been destroyed by the depopulation of America and Europe. These results have come from having turned from a too concentrated medical attention to the needs of the ill individual to the needs of the healthy majority. The development of psychiatry is about 100 years behind that of general medicine. In the XIX century, psychiatry was almost completely a matter of description of disease. It christened but hardly thought of curing. Now, the psychiatric trend is one of enormous elaboration of detail as regards the individual patient, of family and personal history, of tales of conflict between personal desire and social regulation. The notion has grown up that if every man gave his instincts full rein there'd be no insanity, in that there'd be no conflict; but then there'd be no society either and the best that could happen would be that the emancipated ones might destroy each other like the proverbial Kilkenny cats. The psychiatrist has given the lawyer the idea that by education the

habitual criminal and delinquent can be normalized. It is at least doubtful if, in this, the psychiatrist has delivered the goods. However, we are trying to procure an individual prophylactic viewpoint by examining the heredity and environmental stresses of our individual insane, we try to comprehend their problems and to aid in their adjustment. But this effort at mental hygiene must not blind us to the fact that in very truth we have no knowledge regarding the nature of mind; the issue between Plato and Aristotle, between Vitalist and Materialist; between Function and Structure, is not yet determined. We do not know if the mind is a thing dwelling, as some tell us in the temple of the body, or whether it is but a function or a product of the body;—we know for certain it works through the body and is susceptible of change by changes in the body. We have seen encephalitis or sleeping sickness as the layman calls it, change at times through an organic process the moral nature of men, convert gentle, sweet natured people into sadistic monsters and innocent behaving children into incorrigible delinquents. We must confess that glorified social service can never lay the foundations of a pathology of mind, which must lie in as yet unknown disorders of neural mechanisms. However, while we are seeking the secrets governing and producing various emotional personalities we must in law adopt a Public Health attitude and do our share towards protecting society by proving that better breedings precede better brains, and by segregating or preventing from increase the proven and incurably unfit.

In the Criminal Courts we doctors as a body, are helping to reverse these aims. We are shielding the individual criminal from Society, when Society has as yet made no plans whereby in the event of release on present charges, the criminal might be prevented from anti-social acts in the future. We must adopt a public health viewpoint in this matter and proclaim as here in our Scientific Assemblies, in the Press, in Public Meetings, that psychiatry cannot properly work through the existing criminal code; that justice is diverted by the absurdity of hypothetical

questions, that twelve laymen cannot be expected to appraise nicely the degree of responsibility of a paranoiac or a high-grade moron, and that the differences of opinion between lawyers and doctors, and doctors and doctors, but-tressed, if not directed by funds from opposed interests—gossiped and wrangled out in courts, elevate crime, debase Law, and prostitute medicine.

The real point at issue in a trial, under the present code, in which the defense is a plea of insanity is not whether or not the mind was unsound, but was it sufficiently unsound as to be unable to determine right from wrong, or if so, was the accused a victim of irresistible impulse to commit the act as charged in the indictment. And let me remind you here of Lord Bramwell, who, when the irresistible impulse plea rose before him, asked, "would the defendant have taken the umbrella had a policeman been present?" The answer was "no." "Well," said Bramwell, "then the impulse was irresistible in the absence of a policeman." Every crime might be said to be committed under such impulse; the object of law is to compel people to resist this irresistible impulse.

The whole question of responsibility for crime has been moot between lawyers and medical men; legal dicta have been incorporated into the body of law from the time of Lord Erskine who directed the jury that "to protect a man from punishment there must be such a prostration of intellect that he does not know his own name nor condition, nor his relation towards others," to the time of the McNaghten case in 1843, when it was laid down that "a defendant is punishable if he knew at the time of the crime that he was acting contrary to law and ethics; that for a defence it must be proven that he was so defective in reason as not to know the nature and quality of his act, or if he did know it, he did not know it to be wrong,"—down to the present day when the calcification of the pineal gland has been gravely put forward * as a reason why a criminal

* In Chicago.

of some eighteen years should be shown preferential treatment for his murderous peccadilloes.

The whole system whereby a defendant employs and pays for medical opinion in the Courts is wrong and should be abolished; a defendant should have no more constitutional right to pick his medical expert than he has to pick the policeman who arrests him, or the judge who presides at his trial. Acquittal on account of mental disease or semi-mental disease, should no longer be tolerated. Psychiatrists and jurists on both sides of the Atlantic have been feeling their way towards realization of some of these ideas in the practical working of the courts. The American Institute of Criminal Law recommended recently the following program:

1. That in all cases of felony or misdemeanor punishable by prison sentence the question of responsibility be not submitted to the jury, which will thus be called upon to determine only that the offence was committed by the defendant.
2. That the disposition and treatment (including punishment) be based on a study of the individual offender by properly qualified and impartial experts co-operating with the Courts.
3. That no maximum term be set to any sentence.
4. That no parole or probation be granted without suitable psychiatric examination.
5. That in considering applications for pardons and commutations, careful attention be given to reports of qualified experts.

A 6th recommendation should be included in this program; that a panel of qualified medical opinion be chosen if possible from University and Major Hospital Staffs,—who would advise the conscience of the Court, who would receive adequate annual remuneration from no private individual or corporation but from the State and from the State only.

The third provision—that no maximum term be set to any sentence of imprisonment or segregation—call it what you will—is of the highest importance. We cannot pick out the community morons, slightly feeble-minded persons, constitutional inferiors, mildly psychopathic individuals for arbitrary incarceration; Habeas Corpus and the rest of our individual liberties have seen to that! but when such incurable people have proven their instability by

crime, by anti-social and badly judged actions, then we, as the Public, have a right to demand their segregation; probably permanent, but certainly prolonged—depending on the natures of their eccentricities and of their crimes.

As a community we are too jealous of the life of the killer and not thoughtful enough of the life that has been ended; we are sentimental about life, and a woolly minded “intelligentsia” try to make us believe that by uplift, moral suasion, movies, gardens, concerts and the latest shows from Broadway, we can make silk purses out of sows ears. The mightiest Teacher of Ethics of our time, said, “By their fruits ye shall know them”—“Does a fig tree bring forth thistles?” Let us put aside a mawkish sugary sentimentalism, let the law do its duty, and do it quickly, and let us doctors put our knowledge at the disposal of the State and of the Courts, but not ply for hire among the unstable, the eccentrics, the psychopaths and the dregs of the underworld.

SOCIAL DANGER OF THE BORDERLINE MENTAL CASE

C. FLOYD HAVILAND

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The first duty of organized society is to protect and maintain itself. However, it cannot adequately do so except as it identifies and controls disruptive social influences. Such influences resulting from asocial and anti-social conduct represent and are the expression of faulty attempts at social adjustment by individuals who will not or cannot conform with social mandates. Psychiatry, concerned as it is with human behavior, may thus properly play a rôle in the present day effort to solve the numerous social problems with which modern society is beset.

It augurs well for the future that at no previous time has so much attention and such intensive study been given man as a reacting mechanism in a social environment as at present, but of even more importance so far as the solution of social problems is concerned and especially the solution of the problem of crime is the study now given to the prevailing attitude of society towards social ills and the determination of the real factors involved in society's reaction to its asocial and anti-social members.

No lasting reforms are possible except as they are supported by prevailing public opinion which, of course, represents the prevailing opinion of the average individual. It is now recognized that the mental attitude of society and, therefore, of the average citizen towards the whole matter of crime has its primary source in the individual mind. It is only by tracing out original psychic sources of one's attitude that the individual will be able to recognize within himself the fundamental reasons for the imperfect methods now pursued in handling the crime situation. The average person experiences feelings of fear, anger and hatred with respect to crime which results in

* Program presented in coöperation with the Section of Neurology and Psychiatry.

the application of the revenge principle with harsh and severe methods of punishment justified by that form of rationalization termed "righteous indignation." However, the application of force in the effort to restrain and conquer crime has not been notably successful and certainly does not promote unprejudiced inquiry. However, after the real rôle played by society itself in the present crime situation becomes more generally recognized and corrective action is modified in harmony with the real facts of the situation a greater degree of success may be anticipated.

An appreciation of the failure of society to recognize generally its own failure in the matter does not in any way lessen the legal responsibility of the individual criminal, nor does a discussion of the facts constitute an ill advised plea for the criminal offender. It merely means that in considering the situation the objective must be substituted for the subjective viewpoint that the most rational and, therefore, the most successful method of treatment be devised.

Approaching the problem of crime from widely divergent standpoints, the legal profession and the medical profession now evince a desire to understand the position of the other and to seek a common ground in the consideration of conduct which conflicts with the criminal law. The legal profession, primarily concerned as it is, with questions of responsibility, the so-called "guilty mind" and with punishment, admits that law must gradually evolve in accordance with the facts of life and that new conceptions of undesirable human behavior must gradually be reflected in statutory provisions governing criminal procedure. On the other hand, the medical profession, primarily concerned as it is with questions of the motivation of conduct and with cause and effect in relation to human behavior is aware that legal conceptions represent the accumulated experience of many years and may only safely be altered in the presence of well tested, incontrovertible data. However, with a coöperative spirit animating the

two professions and with a sincere desire to deal with crime on an objective basis, eliminating so far as possible the personal prejudices which every individual, consciously or unconsciously possesses, there is every reason to believe that eventually society will profit from its experience and be more successful than at present in dealing with crime as well as with all other social problems.

Society has already recognized the social hazard resulting from overt mental disease and has erected reasonably effective defences with respect thereto, especially when unassociated with crime. However, there has been less general recognition of the social hazard resulting from borderline mental disorder, the incidence of which results in numerous disruptive social influences, the sources of which are frequently unrecognized. Society has, therefore, as yet failed to erect adequate defences with respect to what might be termed the lesser mental disabilities, with the result that it is an open question as to whether in the present situation greater social depredations result from overt mental cases or from infrequently recognized borderline types.

It is, of course, no diagnosis to designate a person as a borderline mental case. It is, however, a useful generic term applied to a most heterogeneous group of individuals who present a common difficulty in meeting the ordinary demands of society and in living a life in conformity with social decrees. Furthermore, they constitute a group of individuals for many of whom something can be done, especially if corrective treatment be instituted early in life. While the view formerly prevailed that borderline cases developed on the basis of some inherent defect in the biological structure it is now generally admitted that the majority of them represent the result of conditioning by the experiences of life, on which basis therapeutic possibilities are, of course, enhanced.

It may be emphasized that identification of an individual as a borderline mental case by no means implies lack of legal responsibility for criminal conduct, but it does imply

the need of corrective treatment. Psychiatry has no direct interest in the question of responsibility which is strictly a legal matter but it is concerned with the determination of how and why undesirable conduct is manifested. It is primarily concerned with the individual and the abnormal mental activity revealed by conduct and of which conduct is an expression.

However, as the individuals under discussion are definitely of abnormal mentality as measured by the standard of general average mentality in the community it may be suggested that when they come into conflict with criminal law they should receive other treatment than that accorded normal persons. It is on such basis that the idea of partial responsibility has been advanced. As psychiatrists we know there is no definite line of demarcation between mental health and mental disease but rather an infinite series of gradations from one to the other. Hence, when criminal law attempts to draw a definite line delimiting legal insanity it runs counter to the facts of nature. If certain forms of mental disease are deemed sufficient to relieve from criminal responsibility completely, it appears illogical not to relieve from full responsibility at least partially when criminal conduct is associated with one of the lesser types of mental disorder.

While many criminals may properly be grouped as borderline cases the vast majority of persons in the twilight zone of mental ill health remain in the community without coming into conflict with the criminal law, but none the less coming into conflict with social law and requirements thus contributing in an undue measure to such social problems as dependency, inebriety, drug addiction, immorality and, in some instances, to such unhealthy social manifestations as marital discord, destructive radicalism and antagonism to constituted authority. Thus the efficiency and stability of the social structure is materially lessened by such individuals even when criminal conduct is avoided.

Among the major types of individuals who may in the majority of instances be regarded as constituting borderline mental cases are psychopathic personalities, the higher type of mental defectives, dull and intellectually retarded normal persons and neurotic, psychoneurotic and emotionally unstable types.

Psychopathic personalities unquestionably contribute the largest number of individuals to the group and one is often tempted to think that most of the troubles of the world are due to the activities of psychopathic individuals. According to the most recent and most reliable data they not only constitute the majority of mentally abnormal criminals, but they are likewise responsible for a large part of all social ills. While the group is not well defined and occasionally diagnosis is difficult, yet there is no doubt there is a large number of persons in the community and in penal institutions who with normal or even superior intelligence show a life-long inability to make satisfactory social adjustments. Apparently unable to profit or be guided by experience they show a fundamental emotional defect which leads to attacks of unreasoning irritability, undifferentiated excitements or depressions and paranoid episodes. They are the ill balanced, eccentric cranks and the suspicious, hair-trigger, explosive personalities who lack ethical sense and become life's failures and trouble makers. Many such personalities are first revealed at adolescence when emancipation from the family proves a task beyond their capacity. They shun responsibility, constantly change their positions and fail to capitalize opportunities. In extreme cases they become shiftless, idle and reveal a lack of shame, judgment, ambition, perseverance and initiative. The mere recital of some of the salient features of the psychopathic personality indicates the ease with which such a person comes into conflict with both criminal and social law. The psychopathic personality among criminals is apt to be of a pronounced type and unfortunately efforts at rehabilitation have not been attended with much success. Nevertheless present practice compels the return of such an

individual to society at the expiration of sentence with the practical certainty that he will return to further criminal activities. While psychiatry has not infrequently been mistakenly accused of seeking to "coddle" prisoners and of attempting to relieve from criminal responsibility because of mental disease, the fact is the psychiatric viewpoint is often more drastic than the legal. From the viewpoint of psychiatry it would be desirable to keep every criminal confined irrespective of the crime committed, the character of which is often more or less an accidental matter, until through a thorough study of the physical, mental and social factors involved, there appeared to be a reasonable prospect that the individual could re-enter society without becoming a menace. However, continued confinement would not be on the basis of punishment but primarily for the protection of society and incidentally for the good of the individual concerned.

The Baumes Law appears to be producing reasonably satisfactory results because it provides continued confinement for a group of criminals who are advanced in crime and who, normal or abnormal, are so definitely anti-social that rehabilitation appears a remote possibility. However, if such a law were based upon the criminal's mental condition with regard to anti-social tendencies rather than upon the number of felonies of which it has been possible to convict him and there remained the remote possibility of return to society, provided prolonged observation and careful examination justified such action, not only the individual concerned but society would benefit.

By formulating criminal procedure in the manner suggested society would be doing only what it has already done with respect to those who suffer from overt mental disease. No one would now regard it a rational procedure to sentence persons suffering from pronounced mental disease to a specified period of hospital residence yet that was once done in some jurisdictions. However, society is now convinced that proper protection from the legally insane is only secured if confinement is indefinite and

until such time as the individual's mental condition justifies a return to a social environment. There is no logical reason why exactly the same attitude should not eventually be assumed with respect to the person who manifests anti-social tendencies of a criminal nature irrespective of the existence of mental abnormality, but certainly the same procedure should be adopted for those suffering mental disorder in a lesser degree.

The social damage aside from criminal conduct which results from the activities of psychopathic personalities is tremendous. Only the practicing psychiatrist is aware of the amount of marital discord and the number of broken homes which follow the constitutional inability of the psychopathic individual to effect satisfactory adjustments. The child so unfortunate as to be brought up in a home where there is a psychopathic parent does not have a fair opportunity for mental development irrespective of material advantages and while accurate data is lacking on the subject it is a fair assumption that the number of failures among children so handicapped is out of proportion to the general population. Often such children have been regarded as suffering from hereditary nervous taint although, as already indicated, organic defect has never been demonstrated and it now appears that such children develop psychopathic personalities because of conditioning by the experiences of the home life.

Society is damaged by psychopathic personalities in the economic field. Industrial efficiency is lowered and labor turnover is increased through the ever-evident lack of ability to adjust to environmental conditions. But limited data is available respecting the rôle played by the various types of borderline cases in the production of dependency. However, a few years ago a psychiatric survey was made of a group of families seeking aid from one of New York's large relief agencies. Without quoting the statistical data upon which final conclusions were made the latter may be quoted as follows:

"So far as the data collected in this study are concerned four main causes for dependency seem to be indicated as follows:

1. Those cases in which illness or death of the income producers has rendered aid necessary. Even in this class one might show that faulty attitude towards responsibility existed in failing to provide for such an emergency; on the other hand, of course, there are instances where misfortune overtakes even the most careful.
2. Those who show a very definite mental disorder sufficiently pronounced to class it as psychotic or psychoneurotic and who are, therefore, incapable of assuming and carrying responsibility.
3. Those who are definitely intellectually subnormal and have not therefore sufficient intelligence to be efficient.
4. Those whose personality is constructed in such a way that it becomes impossible for them to adjust themselves efficiently to the demands of their environment. The greatest number of dependents examined during the course of this study fall to this group."

Further studies are, of course, needed along the above line but there appears no doubt that the psychopathic personality is an important factor in the production of economic inadequacy.

Another important type of borderline mental case is the relatively high grade mental defective, who constitutes a greater social danger than the well marked gross type of defective. The latter is recognized with relative ease and in most communities there is at least some provision for institutional care. However, it is now estimated that even including all varying grades of mental defect, not more than one defective in five needs permanent institutional custody. From a social standpoint there are good as well as bad mental defectives. In at least the higher grades the emotional development and stability is relatively of greater importance than the lack of intellect. Even more than is the case with normal individuals is the difference between the socially useful defective and the socially inadequate defective the result of early training, guidance and supervision. The vast majority of defectives may be trained to fill a useful, though perhaps lowly niche in the social fabric. On the other hand, the moronic type

of individual is rarely recognized unless and until a definitely anti-social act is committed. After such persons pass adolescence they find greater difficulty in meeting the increased demands of life. They are constitutionally unable to compete on equal terms with their fellows and to guide their own activities with ordinary prudence, but the fact that they are intellectual defectives is only revealed on examination, often after society has sustained some damage at their hands.

A case in point was encountered in a certain institution in which a number of fires occurred with considerable loss of property before it was discovered they had all been set by a minor employee who thus found an illegitimate means of getting into the limelight and thus securing a satisfaction denied in his daily life. He was found to be a moron whose life history revealed a constant succession of failures and when as a member of the institutional fire department he was commended for his energetic efforts in extinguishing a small fire he found the experience pleasing and desired to repeat it. Furthermore, by setting the fires he was able in each instance to send in the fire alarm, a fact which led to his detection, but which to him meant only a means of obtaining additional commendation. Sentenced as he was to a specified term of years in prison it is to be doubted if he will return to society any better fitted to live successfully in a social environment. While society is protected during the incarceration of such an individual, protection is inadequate lacking successful effort at rehabilitation or indefinite confinement so long as efforts at rehabilitation are unsuccessful.

There is a general impression that mental defect bulks large in any average penal institution. A recent survey of a number of penal institutions shows varying percentages of defective criminals ranging from approximately 10 to 70 per cent. Such a wide variation of percentages forces the conclusion that varying standards and varying methods of examination were employed, especially as the institution with the largest percentage of defectives failed

to report any cases of psychopathic personalities which in the most reliable prison surveys are shown to constitute approximately one-third of the penal population. It appears a fair conclusion that the more reliable a survey of a penal population the lower the percentage of defectives and the higher the percentage of psychopathic personalities. Probably a fair average of defective criminals would range between 10 per cent and 20 per cent, so it does not appear that mental defect as such is as prominent a factor in the crime problem as was formerly believed to be the case. Furthermore, there is reason to assume that defective criminals are more apt to be detected and confined than are normal criminals. They are the unsuccessful criminals who thus form a larger percentage of those in prison than of the total number of persons violating the criminal law.

Another group of borderline cases are the dull and intellectually retarded persons who are not actually defective. Many such cases are erroneously diagnosed defectives but much can be done for them through therapeutic effort. Strecker of Philadelphia has reported a series of so-called defectives examined by him in an out-patient clinic in which over half the cases revealed that the results of psychometric examination were dependent upon remedial physical conditions such as adenoids, enlarged tonsils, defective vision and hearing and other special sense disturbances which interfered with the ready acquisition of knowledge. Such persons are, of course, more prone to come into conflict with criminal and social law than the normal individual who is not thus handicapped, but they probably constitute a relatively small proportion of offenders, although there is but limited accurate data on the subject.

The neurotic and psychoneurotic group including persons of unstable emotional makeup also includes a certain number of criminal and social offenders, although the number of criminal offenders is probably small but when they do come into conflict with the law they, like the dull nor-

mals, offer reasonable prospect of rehabilitation if proper treatment is undertaken at a sufficiently early date.

While it is scarcely proper to group cases of definite mental disease with the borderline group yet the fact remains that society often fails to recognize mental disease as such and regards an individual suffering from a mental disorder as merely odd, queer or a little eccentric, thus permitting a potentially dangerous person to remain at large. During the past year two persons were murdered in this city by a paranoid praecox who had been flying danger signals of the most obvious character for over two years. On one occasion he even sought assistance on his own initiative because, as he afterwards explained, he was becoming afraid of the voice which constantly kept telling him to shoot. Failing to obtain assistance he finally did shoot and is now in the Matteawan State Hospital.

As psychiatrists we know overt mental disease does not develop out of a clear sky but develops slowly and insidiously over long periods of time and it is appalling to realize the number of tragedies which are constantly occurring as the result of unrecognized mental disease which theoretically could and would be prevented if society provided adequate facilities for the detection of mental disorders.

Social workers frequently complain of difficulty in securing the removal of mental patients for observation when the patient or family object. Even yet there is insufficient appreciation of the fact by the general public that the interests of society and of the disabled individual are both served by rendering means of treatment easy of access. No one would think of registering an objection to the removal to a hospital of a person suffering from a broken leg or from a pneumonic process if found to be receiving inadequate care in the home, yet the situation is analogous with respect to mental disease. The right to liberty, however, is still regarded by many outside the medical profession as of more importance than the right to treatment to the detriment of both the individual and society.

For several years a bill has been regularly introduced in the Legislature providing that no patient may be committed to a State Hospital except only after a jury trial. Fortunately it has failed to receive favorable consideration, but it reveals a woeful lack of appreciation of the real facts respecting mental disease which is, of course, most successfully treated in the earlier stages when the patient may still be regarded as a borderline case.

Every person who reads the daily papers is aware that assaults, murders and suicides constitute a considerable part of the daily news but it was not until the past few weeks that I have realized the enormous damage society is constantly sustaining as a result of the failure to deal adequately with potentially dangerous mental cases in the community whether borderline or actually psychotic. During the past five or six weeks I have clipped all newspaper items coming to my attention in which it appeared reasonable to believe abnormal mentality was a factor in the production of a crime, although in some instances the abnormality apparently was not of a type to meet the test of legal insanity. It is unnecessary to enumerate the gruesome list of murders, suicides, vicious assaults and unexplained disappearances in which abnormal mentality undoubtedly played a part, but it may be said that during the short period noted and with only casual and hurried reading of the newspapers thirty-one cases were noted. No further evidence seems necessary to show that society is as yet insufficiently protected from the depredations of the potentially dangerous mental case.

It would, however, be most unfortunate if the legal profession or the laity gained the idea that there is any necessary relationship between mental disease and crime as, of course, the vast majority of mentally ill persons are not criminals and society suffers only through their withdrawal from productive activity and the necessity of caring for large numbers of them at public expense. There are constantly between 700 and 800 mental patients on

parole from the Manhattan State Hospital in the Boroughs of Manhattan and the Bronx but they are selected for parole with considerable care and, of course, homicidal and suicidal tendencies are considered a bar to removal from the hospital. Thus it is rare for a paroled patient to come into conflict with the law. Indeed the proportion of offenders among them is probably less than among an equal number of persons in the general population.

Crime like mental disease, either of the overt or borderline type, is most successfully attacked in its incipiency. That means also that as in physical disorders social and mental disorders are most effectively combatted through prevention rather than cure.

The report of the State Crime Commission on the causes of crime indicates that the surface causes described are many and various and suggests that the more it is possible to individualize the treatment of offenders on the basis of the mental type presented the greater the possibilities of rehabilitation. Mass treatment has not and will not prove effective in dealing with crime. However, the report mentioned reveals the further significant fact that the vast majority of offenders began as juvenile delinquents in childhood and that crime, like most forms of mental disorder, extends its roots back to the earlier years of life. The Police Commissioner of New York City made a statement a few days ago bearing upon this point when he stated that 55 per cent of the men in the daily lineup at Police Headquarters were under twenty-one years of age. Thus while it is evident there is no panacea for either the prevention or cure of crime any more than there is for the prevention or cure of mental disabilities, yet the nearest approach to a wholesale attack upon both is through the present-day effort at child training which implies parent training on a rational, common sense basis. The work of the Child Guidance Institute clearly indicates that the average "problem child" is not the result of defective intellect but is produced through a lack of what might be termed "emotional education." Normal intelligence with-

out emotional balance and control is a questionable social asset. It is the "problem child" who contributes in undue measure to all the various asocial and anti-social groups and to reduce social ills, especially that of crime, direct attack must be made during the germinal stage in the early years of life. The child is not to be blamed for its conduct; it is a reacting mechanism which reflects in behavior the environmental influences, especially those of a social character, to which it is subjected.

Definite progress can only be made as the public is increasingly informed upon the subject and the educational influences of child guidance institutes and other child training agencies with their associated psychiatric social service constitute not the least of their functions. Mental hygiene societies, social agencies, parent-teacher organizations and such movements as the Boy and Girl Scouts, the Big Brothers and Big Sisters and the Knighthood of Youth are all agencies through which the youth may be taught normal means of self-expression with emotional guidance and control so essential in our present complex social organization with its ever increasing demands upon the individual. As such agencies and movements increase in scope and influence and as children are taught how to obtain satisfaction and self confidence through normal social adjustments, juvenile delinquency and other juvenile behavior problems may reasonably be expected to diminish, thus stemming the tide of both criminality and mental disease at its source.

However, the most strategic attack upon both crime and mental deviations can be made through the public school system where there is practically a cross section of the population at a definite age level. Society is now missing perhaps its greatest opportunity to cope successfully with its potential misfits in failing to make mental hygiene or psychiatric service an integral part of the educational system available for both pupils and teachers. It is true beginnings have been made and according to the National Committee for Mental Hygiene seventeen institutions of

higher education now provide mental hygiene service for their students. However, the public school system has in but few places progressed beyond the point of providing special classes for intellectually retarded children when, as has been pointed out, such children often offer less of a social problem than the potentially normal psychopathic children among whom it is often possible to identify probable later criminal offenders and probable later cases of mental disorder of greater or lesser severity. The greater emphasis is now placed upon the retarded child whereas equal emphasis should be placed upon the psychopathic child who possesses greater possibilities for social usefulness.

Despite society's best efforts it is to be realized that crime and criminal procedure will always be with us. Hence, means should be provided for psychiatric service for all criminal courts and especially for all children's courts. Indeed, it is utterly impossible for the latter to function successfully lacking psychiatric service. If criminal courts were generally provided with means for making psychiatric examinations in a routine manner of all persons accused of crime who present behavior anomalies it would be possible to sift out the borderline mental cases and deal with such individuals on the basis of personal assets and deficiencies by which means alone is rehabilitation possible. Overt mental cases are usually recognized under present conditions when they reach a court even if previously unrecognized but the less obvious mental cases are too often still dealt with on an assumption of normality with the ill results which are all too apparent. After all, the majority of criminals committed to penal institutions eventually return to society and it is but common sense to urge that while they are under society's direct control every effort be made to discover the real fundamental causes of their criminal conduct and to make them over, whether mentally normal or abnormal, into useful members of society.

Probation and parole systems are successful in proportion to the amount of study it is possible to give the individual offender and in such connection psychiatric service can be of enormous value.

It is frequently urged that psychiatric service is expensive and that society cannot afford the additional expenditure required. It appears rather that society cannot afford to do without such service. Under present conditions with little special attention given the borderline mental case who becomes a criminal offender and with but limited attempt at the rehabilitation of the normal offender the cost of crime is enormous. Mr. E. R. Cass in his presidential address before the American Prison Association last October gave the latest figure as Thirteen Billion Dollars which must, of course, be regarded merely as an approximate estimate. However, it is certain that the cost of crime not only in money but in insecurity of property and life is so great that no scientific plan of attack should be ignored because of cost, which is insignificant when compared to the cost of failing to provide maximum protection against criminal depredations.

To recapitulate briefly :

1. Attitude of society itself is an important factor in the solution of social ills especially the problem of crime as the objective must be substituted for the subjective viewpoint to secure successful treatment. A hopeful sign for the future is the evident desire on the part of the legal and medical profession to coöperate in dealing with crime.
2. While society has erected reasonable defences against overt mental disease, it has failed to do so with respect to borderline mental disease although social depredations result from both.
3. While borderline mental disease is not a diagnosis the heterogeneous group so designated presents a common difficulty in securing satisfactory social adjustments. When borderline cases reveal criminal tendencies their abnormality suggests the idea of partial responsibility, although it would be dangerous to relieve them from entire responsibility.
4. Not all borderline cases come into conflict with criminal law but do come into conflict with social law and thus contribute to many social problems other than the problem of crime.

5. Major types of borderline cases are psychopathic personalities, moronic defectives, dull normal persons and neurotic, psycho-neurotic and emotionally unstable types, the most important from the standpoint of crime being the psychopathic personalities.
6. From the psychiatric viewpoint all criminals, but especially those in the borderline mental group should be indefinitely confined irrespective of crime committed until thorough examination gives reasonable assurance that they may safely return to society.
7. The socially destructive influence of psychopathic personalities without criminal tendencies is particularly evident in their influence upon normal home life and upon economic efficiency.
8. The moronic type of borderline case constitutes a greater social danger than the gross type of mental defect. Social danger from defectives results not so much from intellectual defect as lack of proper training. *Most reliable prison surveys show a relatively lower percentage of defectives and a relatively higher percentage of psychopathic personalities than was formerly believed to be the case.*
9. While definite mental disease may not properly be included in the borderline group, yet society often fails to recognize mental disease as such and thus potentially dangerous individuals are allowed to remain at large.
10. Daily newspapers with their numerous stories of tragedies in which abnormal mentality plays a part reveal present inadequacy of social defences against the depredations of dangerous mental cases.
11. No necessary relationship exists between mental disease and crime and the vast majority of mental sufferers fail to come into conflict with criminal law.
12. Crime like mental disease, either overt or borderline, is most successfully attacked in its incipency and individualization of treatment is necessary for successful results. Nearest approach to a wholesale attack upon crime and mental disabilities alike is through the emotional education of the child.
13. While numerous social agencies are available through which to teach the need of social adjustment and the principles of mental hygiene by which adjustment is secured, the most strategic point is through the public school system.
14. Psychiatric service should be provided for all criminal and children's courts and should especially be employed in connection with probation and parole systems.
15. In view of the present enormous cost of crime no question of expense should prevent the establishment of psychiatric service as an integral part of criminal procedure.

MEDICO-LEGAL PROBLEMS

JUDGE CORNELIUS F. COLLINS

Judge of the Court of General Sessions

(Delivered before The New York Academy of Medicine, March 7, 1929 *)

I am not unmindful that a certain temerity is necessary for even a judicial officer who would address a body of professional men and psychiatrists such as constitute the New York Academy of Medicine and especially of the psychiatric section. However, the papers of both of the eminent doctors which we have just heard, included many references to medico-legal problems and to the administration of justice in reference to cases presenting mental problems. Dr. Haviland has especially referred to overt mental cases. I am very glad to take advantage of the opportunity presented to me to-night to suggest some practical remedies to meet the general situation in which we have a joint interest.

NECESSITY FOR COÖPERATION

There has been too great a lack of coöperation between the legal profession and the medical profession in facing their mutual problems in the past. Not alone has there been a lack of coöperation, but there has been an actual conflict. Many of the writers on criminology have been medical men and they have frequently displayed a great deal of impatience with the legal profession. They have been almost unanimous in agreeing that Judges were not very good and lawyers were just as bad. Frequently extreme measures were suggested by them as remedies. Lawyers naturally have not taken kindly to suggested remedies which they felt were too drastic. However, we all know the history of uncoöperative bygone days, and it is not profitable to discuss the situation from that angle. Let us look to a more rational approach to remedying the situation through better coöperation and mutual understanding.

* Program presented in cooperation with the Section of Neurology and Psychiatry.

RATIONAL APPROACH

We have reached a time in the consideration of the problems of medical jurisprudence when we are beginning to see the light. The so called crime wave of recent years brought about the appointment of investigation commissions throughout the country.

CRIME COMMISSIONS

The various states and the Federal Government appointed crime commissions. These investigations produced some concrete results. Of course, whenever there is an untoward condition as to crime, we are apt to have hysterical responses, and in many instances extremes were resorted to in legislation in an attempt to correct judicial criminal procedure. But, generally speaking, great good has been accomplished—there has been a healthy awakening of the public conscience and an earnest desire to effect improvement in the administration of justice. These commissions, undoubtedly, have imparted an impetus to coöperative effort, that cannot help but make for good in the solution of our crime problem and the effecting of substantial reform.

PRESENT DISCUSSION

To consider the subject involved in our present discussion, so apposite to this aim, in a concrete form and to present my view as it applies to the medical papers, I will take up two divisions of the problem separately:

- 1) Having to do with the subject matter of procedure of trials when insanity is formally an issue, and
- 2) The disposition and study of the individual following his conviction upon plea of guilty or the verdict of the Jury.

With the phases of criminal procedure relating to the apprehension of the defendant, the presentation of the case in the Magistrates or Justice's Courts, the attitude of the District Attorney, the action before the Grand Jury, and the preliminary proceeding before a Judge, we are not concerned, for the purpose of this discussion.

COURT PROCEDURE

To outline briefly the successive steps following arrest—a defendant after indictment, upon arraignment before the Judge, may plead guilty as charged or to a lesser offense, or the case may go to trial before a petit jury, and terminate in a verdict of guilty. Thus we have individuals who have been convicted of crime, and have become a resultant obligation to the State through its judicial system for intelligent legal and social action. In many instances in the defence of crime, insanity is urged as a special defence. That subject I will consider a little later. For the present I will confine myself to those convicted, awaiting sentence, who did not plead insanity and where the trial problem of the issue of insanity is not at stake. There are a number of overt mental cases among convicted offenders, but all defendants in criminal courts should receive adequate study. What is the intelligent way to carry on these studies? Society must deal intelligently with the great body of delinquents or we shall fall short of our boasted civilization and intelligence in preventing and treating crime.

DEFECTIVE DELINQUENTS

Among those who are convicted, we find feeble-minded persons of all degrees of mental deficiency—frequently the moron, occasionally the imbecile, and very rarely the idiot. In large numbers there are psychopathic personalities and psychopathic constitutional inferiors and all of the various types that have been classified by psychiatrists.

PSYCHIATRIC COURT CLINIC

In order to study delinquents intelligently, psychiatry and the law must join forces. The necessity for this union is coming to be recognized more and more. True, the Judges are supposed to be skilled in the ways of the law and ordinary experience sometimes qualifies us in discerning peculiarities in individuals, but we are not medical men.

The most rational and common sense plan in my opinion is to associate medical men with the Courts in the disposition of the criminal. I do not think that the desirability of such association is any longer a controversial question. The problem now is one of ways and means.

PYSCHIATRIC MENTAL AND PHYSICAL EXAMINATIONS

Last year an act was passed in the New York State Legislature charging the Courts "with the duty, in coöperation with the proper fiscal authorities, to provide when practicable clinical facilities, and to adopt necessary rules for the use thereof, for such physical, mental, and psychiatric examinations and reports as may be within the required scope of efficient probation investigation and supervision."

To what end? So that the Judges could be guided in the necessarily involved but grossly ignored medical aspect of a case, in determining upon a wise disposition of an offender.

DISPOSITION OF OFFENDERS

Of course each person arraigned before a Judge for sentence has been convicted of a crime. There are a large number of punishable offenses and an infinite number of offenders to be treated. After thorough consideration of all the factors involved, some offenders are placed on probation; others are committed to prisons and reformatories and still others who have been found to be mentally defective or psychotic are committed to institutions for custodial care and treatment.

PROBATION INVESTIGATION

It is obvious that a Judge cannot arrive at a wise decision in the disposition of each case unless he has a well equipped machinery to conduct an investigation of the previous criminal and social history of the defendant. We may well be ashamed when we consider the slight progress that has been made in past years in the development of

presentence investigation, that most necessary guide to wise judgment. Until the comparatively recent recognition of adequate probation standards, we had at the best but very meagre outlines reported by investigators. Judges were compelled to rely almost exclusively upon the police reports for a statement of crime committed and these at times were not entirely reliable.

The Judges of the Court of General Sessions now have available prior to sentence in every case, the benefit of a report based upon thorough investigation. More and more the necessity of having a well established probation department with a staff of efficient and well-trained men and women probation officers is realized to be an indispensable adjunct to the administration of socialized justice. A complete investigation will bring to the judge information which he ought to have relating to the individual whom he is about to sentence, not alone the story of his acts and the manner of committing the crime, the story of his environment and the degree of turpitude involved in the crime but as well his mental and physical condition from the psychiatrist who has made a study of the individual to discern gross defects, if any, to understand the personality of the individual, and to enlighten as to the many involved ramifications.

PROBATION AND PSYCHIATRY

In the case where a judge has determined that an individual should be placed on probation, the probation officer should be informed from the report of the mental and physical examiners where there is necessity for follow up work relative to any other conditions which Dr. Haviland referred to as occurring so frequently. Many abnormal physical conditions such as enlarged tonsils, adenoids, carious teeth as well as mental conditions—neurasthenia, psycho-neurosis, etc., and the probation officer must see that these receive adequate treatment. Perhaps in consultation with a psychologist or psychiatrists the problem must be worked out of re-educating an individual in his habits or the vocational training of the mentally backward

may be a subject for conference with vocational guidance workers.

If an institutional sentence is to be imposed, the judge will be guided largely by the report of a psychiatrist as to whether the commitment should be to a reformatory institution instead of to a penal institution as such. If we commit a prisoner to a penal institution we must consider the individual responsibility as well as the nature of the crime. This affects the degree of turpitude involved and the advice of a psychiatrist in such circumstances could fix largely in our judgment the degree of criminal responsibility.

The degree of criminal responsibility will frequently materially affect the duration of sentence, wherein the Court may have a wide discretion. And furthermore, when the report of the psychiatrist is filed with the probation investigation report at the institution, these reports will serve as a guide to constructive treatment in the prison or reformatory.

Whatever might be said about our progress in the past, it has been insufficient as to practical results in the redemption and rehabilitation of inmates of prisons. The individual convicted was sent away, and invariably, after a longer or shorter period he was released and returned to society, and it was frequently found that instead of being benefitted by his incarceration he had become an even greater power for injury, and a greater menace to society. If, as we propose, we send the psychiatrist's report to the institution with the commitment papers, the efforts that have recently been made by psychiatric clinics that have been established in prisons would be based upon a sound knowledge of the previous condition of the offender.

The prison psychiatrists do not have the benefit of the assistance of investigators to verify the story of the prisoner. The court psychiatrists, on the other hand, are aided by the investigation of the probation officers, who are frequently trained psychiatric workers. When the prison authorities are informed in the first instance of the con-

dition of the individual sent to prison, they are able to determine much earlier regarding the kind of occupational therapy which he requires, and to follow up the recommendations of the examiners regarding the necessary medical and psychiatric treatment in order, as far as possible, to bring about the readjustment of the individual and achieve the most propitious results. And bear in mind that those who have said that this is mollicoddling criminals do not know what they are talking about and betray an ignorance of the subject which has harmful reactions in uninformed circles.

You know that the individual who is sent to prison has to come out some day, and irrespective of any sentimentality—and there is a sentiment which is social—it is your duty to try to readjust him as an individual, a human being, and a member of society. But taking away the sentimental consideration, and regarding only the practical aspect, it is against the best interests of society to send out a convict more confirmed in criminality than when he was admitted. We don't want to send out an enemy to society. We want, if possible, to readjust him and to fit him to occupy his place again among his fellowmen.

PAROLE

When a prisoner is eligible for release, the Parole Board should have before it the psychiatric reports, including that submitted to the Judge prior to sentence, and that of the prison psychiatrist, the probation officer's report, and the institutional history of the offender, in order that they may have an adequate basis for the exercise of their best judgment, and not have to grope in the dark and to speculate as to the previous criminal and social history of the offender, and to be without adequate information regarding the position such men might best occupy in life.

With the assistance of the prison associations and government agencies, the Parole Boards would then be able to use their best efforts against recidivism.

PSYCHIATRY AND THE CRIME PROBLEM

All this seems to me, perhaps because I have been considering the subject so long, to be a, b, c, in indicating the large field for psychiatry as an aid in the solution of the crime problem, as it relates to the important group I have described. Psychiatric service is comparatively inexpensive to government and yet when we asked the Board of Estimate to give \$10,000 last year for the salary of a psychiatrist to be attached to the Court of General Sessions it was refused and the scheme shunted by a proposal that the service be made part of the so-called Consolidated Hospital System of the City. Perhaps such service in the general courts ought to be a part of the public hospital system but General Sessions should be excepted. No activity has been shown as yet in furnishing psychiatric service to any one of the courts notwithstanding the demonstration of its effectiveness. My own impression is that a court like General Sessions, one of the largest and perhaps the most important criminal court in the world, ought to have its own psychiatric clinic. Psychiatry ought to be a part of the administration of justice, an integral part, because it is a necessary adjunct in the effective administration of justice.

CLINICAL STAFF

The law providing for psychiatrists in our courts permitted us to make rules and regulations for their direction. With 2,700 convictions a year in the Court of General Sessions, we would need a man there all the time, a full time psychiatrist, so to speak, with a psychologist, clerical force and necessary equipment. For the psychiatrist we would need a man of eminence and high standing to insure good results. Such a man should be adequately paid. We need a man of capacity and ability who would command respect by virtue of his standing in his profession.

ADEQUATE REMUNERATION

If they can pay a judge \$22,500 a year, I cannot for the life of me see why they could not pay a psychiatrist at

least \$10,000 in a court handling the large volume of serious criminal cases as does the Court of General Sessions. This is to be borne in mind—the measure of doctors' salaries is somewhat different than that of lawyers. A judge is giving all of his time and is forbidden to practice otherwise. It is safe to say doctors in some institutions, although receiving a small amount, do not give their whole time to the hospital and the prestige of an institution is a very large asset to them in their professional practice and they make by virtue of that a larger amount of money in their private practice. That is to be borne in mind.

CLINIC A DEMONSTRATION CENTRE

If we could achieve a clinic in our Court, the largest Court of its type in the country, and having a very large number of defendants to be disposed of, an intelligent study of the crime problem would be afforded and our court could be used as a demonstrating clinic for information to be furnished to the country in general, in the control of the crime problem.

MANDATORY LEGISLATION

It is unnecessary to discuss any further our failure to obtain official psychiatric service in General Sessions other than to say that we have prepared mandatory legislation and the mandatory legislation is to be introduced in Albany, or has already been, with a view to making it incumbent on the city administration to make the necessary appropriation. I can assure you doctors so far as the judges are concerned, we mean business and are doing our level best to the end of achieving that which you suggest and to which you gave such loyal support.

CASES INVOLVING THE ISSUE OF INSANITY

Our next subject, under discussion, is the question of the trial of cases involving the issue of insanity. Of late there has been a considerable amount of criticism of the

system in New York. But the criticism has been rather mixed and unintelligent in its extremes. A picture has been drawn of the conflict of testimony between psychiatrists in trials before a petit jury and of psychiatrists taking sides (alienists they call them when they testify), and large fees being charged by the contending alienists and of the miscarriage of justice—the public being dissatisfied by reason of the verdict of the jury, feeling a lay jury was ill-equipped to determine the question of insanity. That is indeed a picture to evoke laughter. It would make us a laughing stock, if it were true, to have eminent men of a profession testifying on rival sides and then having a lay jury decide which side is correct and rendering a verdict on the confused conflict of experts that has to do with the lives, liberty and property of people. It is wrong absolutely. We all agree to that.

Let me tell you in the first place that the picture is vastly overdrawn. Such a happening or anything like it, has not occurred in New York since the Thaw case. No matter what newspapers you read, no matter what stories and trial calamities you have heard about or how wicked and evil this trial principle is, it has not occurred in New York. It does not happen. I do not think that any of you can recall since the Thaw case one where we had a long drawn out trial involving the issue of insanity.

LUNACY COMMISSION

But we have had in operation a scheme to overcome the evil of such trials. Back in 1871 a scheme of commissions was devised whereby the court was permitted to appoint three disinterested persons to inquire into the sanity of the person accused of crime who pleaded insanity. The statute was loosely drawn, "to appoint three disinterested persons," rather a weak suggestion to make, without trying to further control its personnel. And it is claimed that an abuse of this system exists. It is claimed that there is too free an exercise of the power to appoint such commissions and at times it is done solely for the

purpose of patronage. It is claimed that excessive fees are allowed to the commissions and it is claimed too that the quality of the personnel is entirely unsatisfactory.

COMPENSATION FOR COMMISSIONS

Perhaps the three subjects of criticism are in a measure correct. In several instances excessive fees were charged and allowed in my opinion, and unnecessarily large sums were paid out to commissions. Personally, I believe that the personnel was inferior to the requirements. There isn't any question about the fact that prices paid were at times out of proportion to the service rendered. But counting all of these abuses, they are not nearly as bad as the thing corrected; namely, these trials exploiting opposing alienists and the sense of injustice to the people which they provoked. It is the sense of injustice or the sense of justice that is most important.

REMEDIAL LEGISLATION

I am afraid, in dealing with this subject and in the consideration of commissions, that our psychiatrist friends have not grasped the legal or judicial idea. A Bill was introduced in the present session of the legislature, which purported to remedy these conditions but which in fact went to such extremes as to make the remedy a great deal worse than the disease. I think I could come more quickly to the point if I just read extracts from a communication which I had the honor to send to Albany on this subject and which well expresses, I think, just exactly the position of the courts in this respect. This is addressed to an assemblyman, a member of the Baumes Commission and the Chairman of the Codes Committee in the Assembly:

"As I informed you over the telephone, there is no doubt that the Court of General Sessions will be opposed to the enactment of Senate Bill, Int. 866, Print 940, which is an extremely radical departure from the method of procedure in lunacy cases in this state. To say nothing of its constitutionality—its provisions, if enacted, would lead to a chaotic condition and be decidedly more baneful than the evils that have been complained of under existing law. It would be certain to result in a revival of long drawn and unsatisfactory jury trials attended by all of the objections made to this condition."

In the proposed legislation it is provided that five psychiatrists shall be named—two to be selected by the district attorney, two by the defendant and one by the judge. Can you imagine such a situation in a criminal court, a judge's psychiatrist, two defendant's psychiatrists and two of the People's. Talk about your Kilkenny cats; it would be the precipitation of a fight, and on disagreement, which experience teaches would be very frequent, we would have to go to trial with the issue before the petit jury. Such an alleged remedy as that, in my judgment, will not prove an intelligent cure of the evil.

"It would substitute a partial or biased board of inquiry for an impartial one—and, where conflict were avoided, without resultant jury trial, would not accomplish any better result than the present system."

"You will appreciate that the only criticisms of the existing method of procedure have been (1) that excessive fees were paid in some instances to members of lunacy commissions, (2) that the personnel of such commissions did not require the standard or quality best adapted to the administration of justice, (3) that commissions were too freely appointed without a sufficient basis therefor, impelled rather by the idea of patronage than efficient judicial administration."

"To cure these evils is, and should be, the aim of any prospective legislation. The existing system has been in operation since 1871 and has achieved in a large measure the purposes for which it was established, namely, the avoidance of long drawn out trials before a petit jury upon a question of insanity, which admits of opportunities for great conflict in the testimony of psychiatrists and impairs the public sense of justice in the thought that a miscarriage of justice frequently results and that advantage is given to those whose means affords the opportunity to employ high class alienists over those charged with crime who could not bear the expense."

To meet the evils it was suggested by the court as a substitute that hereafter we should appoint a lawyer and two medical men to lunacy commissions. We will give medicine the major part of the commission but do not get away from the idea that you need a lawyer. Here is what I want the psychiatrist to understand:

"Attention must be called to the fact that there has been a prevailing misunderstanding especially on the part of psychiatrists who have considered this subject as to the function of a commission in lunacy. It is not and was never intended to be composed of men who would themselves,

necessarily, conduct the psychiatric examination of the subject of the inquiry. Commissioners are in the nature of referees who receive and hear the evidence and submit their report to the court. Before such a commission appear psychiatrists who have made the scientific and medical examination and all witnesses whose testimony may have a bearing upon the questions to be judicially determined. The commission is a quasi-judicial body and its report must be submitted to the court for action before further procedure. The court then acts and an interlocutory or intermediate order or judgment results, which means a commitment to a hospital for the insane, or, proceeding with the criminal action. Where there is a finding of insanity, the effect is, in most cases, a final determination."

PERSONNEL OF COMMISSION

And of course, what we suggest, is that two psychiatrists and a lawyer shall conduct a hearing. Psychiatrists might testify before them as to the insanity of the individual or against it. And practice has shown that to-day there is not that conflict that used to exist. Then they would hear the witnesses who are called to tell the family history, who give the story of the crime that would be incident to or applicable to the question of determining the insanity. The lawyer generally presides. The defendant is entitled to be represented by counsel and the District Attorney is required to be in attendance. You have a legal proceeding before that commission.

It is not, as the proposed Bill would indicate, the doctors who conduct the examinations in the hospital, who, in accordance with the legal conception, should constitute the commission or board of referees.

STATUS OF COMMISSIONS

Someone has said, "Why would not the idea suggested by the Bill be the better?" Because those commissioners are not performing a juristic act; are not a judicial body. Doctors cannot dispose of an indictment for murder, or a conviction of burglary. The sense of justice, the carrying out of our system of justice must be considered. You cannot dispose of an indictment by having an examination in a hospital. There must be something to succeed

that examination in a hospital which would record it in a judicial way, place it on record or sum up its action with the court. Either a commission, a referee or the judge should try out the issue of insanity. If you catch the idea, insanity is a special plea, alleging insanity, and our law says that you shall not be convicted except by a jury of your peers. It is an old English system and if we are guilty of adhering to our constitution, we are only doing the same thing our fathers did and following the precedents that have come down to us through all the ages of our common law system.

EARLY CONCEPT OF INSANITY

It is hardly to be expected that our people are going to sacrifice their constitution because they fear they lack the ability to control the insanity cases. But then we have been improving every day. Time was when doctors were threatened with burning at the stake when they said insanity was a mental disease. Time was when the insane were treated as being possessed of the devil and chained in dungeons and all kinds of methods employed to drive the devil from their bodies. Progress has been made along direct and intelligent lines until today we are approaching the light and an intelligent solution of the whole subject.

MODERN LEGAL CONCEPT OF INSANITY

An individual who is not guilty of a crime should not be convicted of it and if he were not a free agent at the time the act was committed, there should be a way of determining that. If he did not know the nature and quality of his act and if he could not distinguish between right and wrong—and the law says that that is insanity—there should be a way of adjudicating the insanity. We certainly ought to be intelligent enough to find a way and not be compelled to confess that we are impotent. And if the legal definition of insanity is wrong, let us, step by step, show that it is wrong and amend the statute that refers to the legal definition of crime or of insanity. We

are not wedded to the legal definition as distinguished from the medical definition. The institution of the commission as it exists to-day, has been good. A remedy should be found to correct the evils that are complained of. You would not cut off a man's head to cure a toothache and you need not wipe out a judicial system by a drastic remedy doing violence to judicial method to determine insanity and to avoid the necessity of going through a long drawn out jury trial.

PSYCHIATRY AN INTEGRAL BRANCH OF THE ADMINISTRATION OF JUSTICE

Of course, I have had to speak extemporaneously on this subject to you. I did not know the contents of the papers of the preceding speakers but I had a general idea of the trend of thought they would present. What I want to convey is this: Gentlemen of the medical profession, psychiatrists, the lawyers and the judges want to coöperate. I am chairman of the legislative committee of the Court of General Sessions. We realize the importance of the subject matter under discussion. We appreciate the importance of psychiatry as an integral branch of the administration of justice and we are anxious that you so regard it. With all the power which lies within us to encourage that idea, we are behind you. We are, not alone willing, but we are insisting upon a coöperation that will bring about progress along these lines in the administration of justice. But for years nothing else has been done but talk about it. In considering the relative merits of psychiatrists and judges, let us remember there have been many different schools of thought on the subject of criminology and in the field of psychology. Who can remember the various names that label the divers schools of criminologists. Lombroso insisted that crime was the result of physical conditions. Even in the present age glandular disturbances are considered a contributory cause of delinquency. The schools carried theory to such an extent that error was rampant.

DISCUSSION

HON. WILLIAM MCADOO: I feel that I am under a time limit because the hour is getting late and the subject is beyond bounds. I don't ever understand why anybody should be stingy with me in the matter of time. I often go to lunches and gatherings where they warn me that I have three minutes or six minutes. Yet I have given people six months who didn't want any time at all.

As to that mixed board that Judge Collins has been talking about, I should think by the time that the three psychiatrists and the lawyer wrangled out the case there would be needed a fourth psychiatrist to determine the mental or psychiatric condition of the board itself.

I have been accustomed of late from a sense of conscientious duty to prick the national vanity and disturb the national complacency with regard to crime in the United States. We have the most appalling list of crimes committed in this country as against almost the whole world. We don't really know the number of crimes committed in the United States. We depend for our information upon police reports and the police reports in all of the cities of this country give us only the number of persons arrested, as for instance if the report was made along this line—Crimes known to the police—in which they might say that they knew there were 5,000 hold-ups and 2,000 arrests or 10,000 burglaries and 5,000 arrests. Then we might approximate the total volume of crime.

Then too in modern times the enginery of crimes has become entirely different. When they hanged for 164 offences in England, some of which offences or crimes so-called would not amount to disorderly conduct in New York, they had no psychiatrists around at all. They were hanged at Tyburn and as they had no movies or prize fights or any of the other amusements of our day, the whole population turned out for recreation witnessing the hanging and hearing the speech of the condemned. He always made a

speech which I suppose was the way they judged his mentality at the time he was stepping off.

We have advanced our civilization until here we are in this beautiful building in the great City of New York, the Academy of Medicine, discussing what we shall do, in a learned way with the person who has been convicted of any sort of crime.

In the Magistrate's Court when we get a case we give it a hurried treatment and then pass it on to Judge Collins and the larger judges. And by the way, that parsimony of the Board of Estimate in not providing the \$10,000 for a psychiatrist, I should suggest to them they might ease their conscience by giving the difference between my salary as Chief City Magistrate and Judge Collins' salary, which would be about \$10,000, to the psychiatrist.

These Magistrate Courts are social hospital clinics in contradistinction to the larger court institutions; we have thirty-seven courts both district and special and 49 magistrates. Through these courts in the year there pass 500,000 people for all sorts of offences and crimes, from spitting on the sidewalk to murder.

Now we—and I am privileged to say that I took some part in it—inaugurated the best probation system in this country. The Chief Probation Officer who is now connected with the Judge Collins' Court came from Buffalo and it was my good fortune to select him for the Magistrate's court and to him the early success of probation is due. Of course we do not deal with serious crime so far as convicted persons are concerned. Take the difference that Judge Collins has called attention to between the lack of a psychiatrist in the General Sessions Court dealing with felonies and very serious offences, and in the Women's court here in New York. And by the way, as a mark of our progress in civilization and humanity, that is the only women's court in the whole world where only women are tried for various offences, wayward girls and shop-lifting women, sometimes respectable women who yield to

temptation, and of course for all sorts of prostitutional offenders. There the Board of Health has a doctor in constant attendance. The convicted women are examined as to whether or not they are suffering from contagious diseases and should they be, they are treated in some hospital and cured and brought back to be disposed of. But that of itself, of course, would be a subject entirely out of the range with that we are talking about here.

We would be glad as Magistrates to have a psychiatrist attached to the court. There was a very able woman psychiatrist who made a study of the women's cases and I do not remember of ever having read anything that was so illuminating, instructive and conclusive as that report. And as I understand it, there is also a psychiatrist attached to the Children's Court.

It has fallen to me as part of my duty officially to pass upon a great many people who have importuned Mayors and Presidents of the United States and who are believed by those in connection with those offices to have dangerous intentions toward public officials, so that for many years past I have been a sort of assistant to that great alienist, Dr. Gregory in the Psychopathic ward in Bellevue and therefore have had an unusual layman's experience in dealing with those people.

It also has fallen to me to deal almost entirely with all of the drug addicts who are sent to Bellevue Hospital and to other hospitals and Welfare Island or "Farewell" Island or whatever it may be called. So I have come in contact with a great many defective people and people who are really insane.

I have come to the conclusion considering our tremendous and appalling and disgraceful criminal record as a nation, for it is not confined to our great cities like New York and Chicago but seems to be widespread, that we are confronted with a menacing and dangerous army of young fellows between the ages of sixteen and twenty-six who are entirely and absolutely anti-social and who

apparently are determined they will not work. And just as the doctor who read that wonderful paper which I hope will have a wide circulation said, in the States' prisons and institutions of that kind a great number of people are subnormal or defective to the extent that Warden Lawes said to me when I made a recent visit to Sing Sing and saw the prisoners being massed in a procession from one part of the institution to another, he said, "The smart boys are not in jail, these are the defectives." And when we know as we do from what occurs occasionally in the courts of the successful and long careers that these fellows follow without being arrested or punished, we must believe that that sort of crime is really successful.

I believe the time must come when instead of sending the young gunman to Sing Sing for a definite term and certain other classes of criminal offenders, there will be in this State and in other States a great community, self-supporting, which will not be a State's prison in its outward and external appearance at least or a penitentiary and to which all of these people will be committed with an indeterminate sentence.

Most of these young fellows who go to our States' prisons, the young fellow standing on the corner down in a neighborhood I could point out, he is determined he never will work and as Dr. Haviland says, he is lacking entirely in those emotions that characterize the normal person. He has no sense of social responsibility. He has lost respect for man and reverence for God. He has no human sympathies. He will shoot down without compunction, without conscience and without heart the little shop-keeper who has not put up his hands quickly enough when he is robbing him at the point of the pistol. And as I said a moment ago, the enginery and mechanism of crime in this country is beyond that of other nations. Pistols are as common in the United States as lead pencils and almost as frequently in use. Our murder record is appalling and disgraceful. In London last year they had only fifteen murders and most of the murderers on being arrested

committed suicide. I think they had very few. The only involved murders I can see are the detective stories so cleverly written by English authors. Whereas here in New York and Chicago, and indeed in even our smaller cities—one of our minor cities in this very State had thirty-five murders—and I won't tell you the list in Chicago or New York, where in Chicago they eventuate in really what amounts to civil war between the law abiding and lawless fellows who dominate the community.

Now I believe that that will be the place for psychiatry and the doctors will get an opportunity of doing a great service to the State, that that young fellow shall not be sent even for a life term or for a special designated period but will go to a community where there will be everything the same as any other assemblage like a village or a town where there will be farms and outdoor work and shops and churches and schools, yes and playgrounds, and where he will not be discharged until these learned gentlemen and all the experts have pronounced him cured of his anti-social tendencies and that it will be safe to allow him to come back into the community.

I have no hesitation in saying to you that in my own judgment and from my long experience in coming in contact with these fellows, that the majority of them are absolutely incorrigible and unreformable, and that by the time they have got a twist and a start in a criminal career the smallest percentage of them can be saved and reformed and made so that they will not be as dangerous in the community as a mad wolf in a children's playground.

That is the sort of people we are dealing with and I am not here of course to say that we should not adopt preventive measures. On the contrary I think we must begin with the children in the public school and in all of the schools, private or public because we have got to reach the child. Remember the mind is receptive and plastic to moral treatment and even to spiritual treatment and we must get it out of the child's mind at a very early age that there are certain inhibitions which must be preserved.

I think one of the curses of our time is our fiction and literature which talks about self-expression. It tells us in the characters depicted in those books that there must be absolute self-expression. Whatever you feel you must have no inhibitions. You must not conform to the conventional modes of life. You must not respect the feelings of the community. You must laugh at the laws; you must be a free woman and a free man and do just what you like and therefore we grow up a crop of human weeds that we are dealing with now and at the expense of the community and danger to communal safety. So we must begin to mix with the children when their minds are receptive and teach them that they have social responsibilities.

One trouble in our day is that so many people are talking about their rights. "Give me me rights!" I hear that in the Magistrate's Court every day. They want all the rights. And I hear from more crooks more about the Constitution and Magna Carter—Oh the Magna Carter! Give the man his Constitutional rights and hand him over his Magna Carter and let him go out and kill somebody else! The Constitution was supposed to be a palladium for the safety of the individual citizen and now they are making it a safety place for crooks. And our criminal procedure, as President Hoover so well stated with regard to Federal Courts (and he might have spoken of all the courts), has become in some instances under the manipulation of clever lawyers, a box of tricks for the benefit of crooks instead of being for the safety of the citizens.

So when we have reformed ourselves, then we will turn around and reform the doctors, whatever is needed with them.

I am strongly in favor of everything that has been said here to-night by the learned doctors. I was struck with what was said by Dr. Kennedy and so truly said. It was the medical profession that built the Panama Canal. When I was Assistant Secretary of the Navy I went officially down to visit the Canal when the French were at-

tempting to build it and all along the line from Colon to Panama was marked by graves, a long, unbroken line of leading Frenchmen, engineers, competent men who had died from tropical diseases and from malaria.

And when we laymen think, when I think back when I came from an Island no larger than Manhattan and the best County in Ireland at that, and how across the river here in the undrained marshes the quantities of quinine that I was compelled to take and before I had been a few months in this country I was shaking over a stove in July and the mosquitos were biting the life out of me every night and I only thought it was the bad air I was breathing and never blamed the mosquitos, when I think what the doctors have done, I realize it is a noble profession. And I am wandering a long way off of what I suppose I should talk about.

Most of my labors down in 300 Mulberry Street are signings warrants for men and women who call themselves doctors but have no licenses. And I have wrestled with chiropractors and other people of that kind until I have felt that I would be delighted to have my own vertebrae, which I am sure are quite dislocated from what they told me, adjusted so all my diseases or apprehensions of illness might be entirely done away with.

Ladies and Gentlemen, I had no idea I was going to talk about psychiatry and God knows I didn't know what I was going to talk about. I had no notes and came here because I wanted to hear the learned doctors and I wanted to learn something about psychiatry which I believe in very much although there are pseudo-psychiatrists who turn up around the courts and it is a young science and probably there may be some in it who are not really very good psychiatrists, but when we get a real psychiatrist I am in favor of psychiatry. And I would like to see some of these learned gentlemen in the Magistrate's courts. The only time that I ever get acquainted personally and intimately with the psychiatrist is when he breaks the traffic rules and they bring him into the Traffic Court. Then I

see more of him than I do otherwise and that is the only time I come, outside of the family physician, in contact with the medical profession. They tell me in answer to a speeding case that they were on the way to the hospital to perform a very serious operation or to save somebody's life and so I say to them, "Doctor, did you get there?"

"Why yes, I got there."

"Did you cure the patient?"

"I believe I did."

"You are a lucky man. How about killing my wife and daughter while on the way to save somebody else's wife?"

So I thank you all and hope the time will come when our civilization will progress in the way that I have intimated and that instead of sending these people so many years to an institution, we shall send them to such a community as I have pictured and there to be kept until they are pronounced socially safe to be at large. We have a splendid probation system and I wish we had a psychiatrist in connection with it.

There is one other trouble about this thing. Here is a young fellow, a borderline. The law says that no matter how the person comes before me as a Magistrate, that if I doubt his mentality I can send him down to the Psychopathic Ward to Dr. Gregory where he is to be kept under observation for ten days. That is just what the law says. It doesn't say the Magistrate must be a very learned man or very wise (if it did it probably would not cover me), but that I must use my discretion and whatever limited intelligence God has given me to say I am in doubt about his mentality which I frequently am, and sometimes I don't know (I listen to so many liars), whether just exactly he is telling me the truth about himself. So I send him down to Dr. Gregory who then keeps him for ten days and then through various processees of law and the Supreme Court he goes to the larger institutions.

But there is one weakness about the whole thing and that is this. You take my eminent and good friend, Judge Collins who is an honor to the judiciary and also as a citizen. And when we have found the borderline case what are we going to do with them? If we had the psychiatrist and he said to me, "This man or woman is a borderline case, not responsible, suffering from nerves," or those cases that so frequently come up in the Family Court just as the doctor says. We used to think in the days before we became total abstainers that alcoholic drinking brought them into the family court. We find that is now not the case and just such cases as the doctor has described break up the family. And there is no place to send those people. We have one institution in New York State which you have probably not heard of before and that is Napanau and there they weed the defectives out of the prisons and send them there. But there should be some place where the borderline woman or man could be sent.

DR. FRANKWOOD E. WILLIAMS: I shall take but a few moments. There is little to be said. There is really no fun in taking part in discussing these questions before men like Judge Collins and Judge McAdoo. If we could have had some other kinds of judges here who looking very dignified would have spread their ermine it might have been much more fun to have closed the discussion. But Judge Collins and Judge McAdoo are such good psychiatrists themselves, they are so understanding about these things that one needs not to discuss these matters with them. One could agree practically to all that Judge Collins and Judge McAdoo have said. Their views are essentially the views, I think, of psychiatrists, who are well informed upon those matters.

But just to sum up a bit perhaps, I think one or two points might be made. The object of course of the psychiatrist in the court is not as is sometimes said to protect criminals from punishment. The object of a psychiatrist in a court is of course precisely the same as that of the lawyer and of the Judge, the protection of society. He has

no other object in being in the court other than to perform a function which may assist in the better protection of society. And the plan that Judge McAdoo has outlined is of course the plan that is in the minds of all psychiatrists who deal with these questions, that is of finding out precisely what is the condition of any given individual in order that a prescription may be written for him that will be as nearly precise as, in this day and age, we can make it, as precise as we write prescriptions for other conditions in other departments of medical work.

We have got to the point at the present time where we can think of writing prescriptions for those who appear in the courts and are insane, or even for those who are borderline cases such as Dr. Haviland has talked about. But that cannot be the end of the matter. The disposition of the insane and borderline criminal is a practical problem that must be met in some practical way, but the problem is much larger of course than this and the differences that arise between the psychiatrist and the legal profession as these larger questions are entered into is not upon the superficial grounds that have often been stated, such as professional jealousy, lack of confidence and the like. These are quite superficial things of no great importance.

Neither is the difficulty between the psychiatrist and the lawyer that of vocabulary as has been said, that the lawyer cannot understand the vocabulary of the psychiatrist and the psychiatrist cannot understand the vocabulary of the lawyer. These are not insurmountable obstacles and they are not important. As a matter of fact, the conflict is really not between the psychiatrist and the lawyer except as they are representatives of something else. We are dealing here with a conflict that exists not only in this department of life but in other departments of life as well and that is a conflict, not between two professions, but a conflict between two great philosophies.

We are dealing here with a conflict between a philosophy built up by induction and a philosophy built up by deduction. We live in a world that is constructed by induction.

Even the most fundamentalist of ministers lives in such a world of induction from his grapefruit at his breakfast table to the telephone which brings an invitation from a wealthy parishioner to have a ride in another inductive instrument, the automobile to a certain studio where this fundamentalist minister may talk over the radio.

In the protection of his food supply, his water supply, in all of the various departments of his life, in his relationship to the world, this man lives as do we all in a world that has been created and built up through induction, that is through the process of observation and building from the observation.

But when it comes to such matters as law, such matters as ethics and morals and religion, and those great departments of life which have to do with the relation of human beings to each other, although living in a world of induction, we pass from this world in these relationships to an older world built up through a process of deduction; that is, systems of law, ethics, morals and religion that have not been built up through observation, and building from observation, testing and re-observation but have been built up on the basis of philosophical assumption. Starting with an assumption—from the arm-chair—one continues to build by deduction, the end result often being a top-heavy structure that is sometimes very far from being related to life.

The law is to be classed not with chemistry and engineering and medicine, but law must be classed with ethics, morals and religion. It is a system based upon philosophical assumptions and built up by deduction and that it sometimes gets quite far apart from life in any real sense is not surprising and the conflict therefore when the lawyer and the psychiatrist come together is not over vocabulary or this, that or the other unimportant superficial thing, the conflict is between these two philosophies.

The psychiatrist and the lawyer, both honest men, both honorable, both sincere, both wishing to solve a certain

problem, the one starts from an observation of facts and on the basis of these observations he reasons logically and comes to a certain conclusion. The other starts with an assumption, and reasons clearly, logically, but deductively and arrives at a certain conclusion. These two men then find that they have reached decisions that are quite far apart and they are amazed for having started from the same situation and both having reasoned accurately and logically how could they come to such diverse conclusions? The reason has been, of course, that the one started from an observation and the other from an assumption. And there will always be conflict between the lawyer and the psychiatrist as long as the law remains a deductively built up instrument to be classed along with religion, ethics and morals.

We can come together to discuss certain practical problems as, shall there be a psychiatrist in this court or shall there not? Shall we send borderline cases here or send them there? Shall the judge decide or shall the psychiatrist decide? These are very practical issues that psychiatrists can get together with Judge Collins and Judge McAdoo and such lawyers and decide. But this is really only patching up the old situation. It moves us along step by step but it really does not get us anywhere in particular and we will never really get anywhere until the whole criminal code is entirely rebuilt on an entirely different basis and law and criminology takes its place along with the other inductive groups, with engineering and with medicine, and leaves its position with the older deductive philosophies. Then the question of insanity or borderline or whatnot becomes of no importance. Then the lawyer in coöperation with the specially trained psychiatrist will approach any given problem not starting with certain assumptions or certain philosophies built up deductively, but will start with observed facts in an effort to determine what, indeed, is the situation in regard to a particular individual? Why does this individual commit crime or why has he done this particular act?

A woman comes into a hospital and she is shrieking. Why does she shriek? But we do not sit down under a fig-tree and develop a philosophy about why women might shriek and then apply these fig-tree philosophies to this particular woman who is shrieking in 1929 in the hospital. We proceed to examine the situation and find why the woman is in pain, where this pain is and what is causing the pain. And then we attempt to relieve the particular situation.

We have to proceed so in the matter of crime and then we shall be concerned not alone with cases of insanity or borderline conditions or moronity or feeble-mindedness. It will be even more important to discuss this matter in relation to the individual who is called normal, whatever that is. Then the psychiatrist and lawyer can sit down together, study these problems as we now study our problems in medicine and arrive at some conclusions that may make it possible to write prescriptions with at least a reasonable degree of accuracy.

It would be presumptuous for me, perhaps, a member of the medical profession, to speak of a recasting of the criminal code except for the fact that it is not merely a matter of saying what ought to be done, but it is a matter that really is being done at the present time. Not in the criminal courts, but in the juvenile courts precisely this thing is being done and it will eventually be done in the criminal courts. And furthermore, at least two of our great law schools, Harvard and Yale, are showing an interest in precisely this question—a working out of a code of criminal law that will be upon an inductive basis rather than upon a deductive basis.

SECOND GRADUATE FORTNIGHT OF THE NEW YORK ACADEMY OF MEDICINE

OCTOBER 7 TO 19, 1929

"Functional and Nervous Problems in Medicine and Surgery"

Encouraged by the success of the first Annual Graduate Fortnight held last October, The New York Academy of Medicine has arranged for a second Graduate Fortnight, to be held October 7 to 19 of this year and has chosen as the subject "Functional and Nervous Problems in Medicine and Surgery." The field includes those functional disturbances which have been much neglected in the last thirty years, in comparison with the structural disturbances of the human body. The topic covers differential diagnosis of functional and organic derangements in all branches of medicine and surgery. It is believed that the subject will attract not only the medical profession generally but also social workers and those interested in public welfare.

SESSIONS IN TEACHING HOSPITALS

In the afternoons nine of the large hospitals of the city, with an abundance of clinical material, will coöperate in the Fortnight by presenting specially arranged clinical programs, bearing upon different phases of the general subject. Besides the special programs which will be presented, over forty of the teaching hospitals of the city will offer (mornings and afternoons) non-operative clinics and conferences in various clinical specialties, and in mental hygiene subjects, such as behavior and habit problems, child guidance, and vocational adjustment.

The profession generally is invited to attend.

No fees will be charged for attendance at any of the clinics or meetings on the program.

A complete program and registration blanks for special clinics and demonstrations will be mailed on request.

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Cambridge, Harvard univ. pr., 1929, 244 p.
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LIBRARY HOURS DURING THE SUMMER

From June 15 until September 15 inclusive, the Library will be open on week days from 9 a. m. to 5 p. m., on Wednesdays from 9 a. m. to 10:30 p. m., and on Sundays from 10 a. m. to 5 p. m.

OBITUARY

PROFESSOR JOHN A. MANDEL

On Sunday, May 5, 1929, Professor John Alfred Mandel died after an illness of two years' duration. His death was due to myocarditis and he bore the slow and insidious developments of this disease with fortitude.

Professor Mandel was born October 18, 1865, in Stockholm, Sweden and was brought to this country by his parents at the age of five. The family settled in Boston, Mass., where he received his early education in the public schools and the English High School of Boston. Later he studied at the University of Berlin specializing in Chemistry and allied sciences. He received the degree of Doctor of Science from New York University in 1901.

He was married in 1891 to Paula A. Heinrich of Berlin, Germany, who survives him.

His academic career began in 1884 when he became the assistant to Professor Charles Doremus at the Bellevue Hospital Medical College. In 1894 he accepted the appointment as Professor of Chemistry in the New York College of Veterinary Surgeons and held this position until 1897. From 1897 to 1898 he was Assistant Professor of Chemistry and Physics at the College of the City of New York and at the same time was Adjunct Professor of Chemistry at the Bellevue Hospital Medical College. From 1898 until his death he was Professor of Chemistry in the University and Bellevue Hospital Medical College of New York University.

Throughout his career Professor Mandel took active interest in Scientific Societies here and abroad. He was a member of the following: American Chemical Society; American Physiological Society; American Association for the Advancement of Science; Society of Biological Chemists; Society for

Experimental Biology and Medicine; Harvey Society; Deutsche Chemische Gesellschaft; Associate Fellow, New York Academy of Medicine. In addition, he was a member of the Century Association, New York, and the Nu Sigma Nu and Phi Gamma Delta fraternities. He attended practically all of the International Physiological Congresses for the past 35 years.

He was a man of broad culture and an indefatigable research worker in Chemistry, having contributed many original papers to the chemical journals. His researches were carried out independently in part, as well as in collaboration with Carl Neuberg, P. A. Levine, E. K. Dunham and Hans Oertel.

The principal field of his researches was the chemistry of nucleic acid, and he published papers on nucleic acids and glutathionic acid of the mammary glands; and, nucleic acids and their cleavage products; also on the origin of glycuronic acid.

Professor Mandel's translation of Hammarsten's well-known "Lehrbuch der Physiologischen Chemie" was first done in 1893 and he translated five subsequent editions of the book, thereby furnishing a most valuable aid to the Biological Chemists of this country and England. He also translated Arnold's "Repetitorium der Chemie."

His own works include a "Handbook for the Biochemical Laboratory," 1896 (J. Wiley and Sons) "Handbuch für das Physiologische-Chemische Laboratorium" 1897 (M. Krayn, Berlin) and "Micrometrische Methoden der Blutuntersuchung," in collaboration with Dr. Steudel, Berlin 1921 1st ed., (translated into Italian 1924) 1924 2nd. ed.

In 1912 Professor Mandel was created a Knight in the Order of the North Star by King Gustave of Sweden for his scientific work and writings, and received in 1914 the Rote Kreuz Medaille from Emperor Francis Josef of Austria for his work in the Austrian Red Cross. In 1923 the honorary degree of Doctor of Agriculture was conferred upon him by the University of Berlin, and in 1926 he was elected a member of the German Academy of Natural Sciences of Halle. In 1924 he was made an Honorary Member of the Berliner Physiologische Gesellschaft. He was a frequent and welcome guest in many of the cultural centers of Europe, especially in Germany, where he carried on investigations in numerous laboratories, and but a short time ago was the recipient of an invitation from the George Speyer Laboratory for Chemotherapy, the scene of Paul Ehrlich's activities, which extended to him its courtesy for a whole year.

Professor Mandel will be best remembered by his thousands of students for his eloquent and forceful teaching. He was a splendid and inspiring lecturer and had the rare ability to impart his knowledge. Many of his students will remember his kindly sympathy and ready help in their difficulties. His life is best summed up as one of devotion to his students and science. His death is a profound loss and is mourned by his friends, associates and students who revere his memory.

W. C. MacTAVISH.

CORRECTION

In the March number of the Bulletin, (Second Series, Vol. V, No. 3, page 276) under Recent Valuable Accessions to the Library, a gift from Dr. F. C. Matthews was mentioned. The name was incorrectly spelled and should have read Dr. F. S. Mathews.

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EDITORIAL

DEVELOPMENTAL POSSIBILITIES IN MEDICAL HISTORY AS A BRANCH OF THE MEDICAL CURRICULUM

At the Johns Hopkins University, the conferring of degrees, academic announcements, presidential and other addresses are all included in the ceremonial functions which take place on Washington's Birthday. The address for the present year was delivered by Professor William H. Welch, who now occupies the chair of history of medicine. Dr. Welch spoke at length of recent developments of the subject in Europe and the United States, which have been carefully tabulated by Professor Sigerist (Leipzig),¹ of the consolidation of the three libraries of the Johns Hopkins Medical School, Hospital and School of Hygiene in the new building which bears his name, of the inspiring influence of Osler in activating an interest in the historical approach from the start, and of its important rôle in the academic curriculum, both as a discipline for the mind and as an agency of humanistic culture. If it seem odd, at first sight, that the history of medicine should have acquired the salient, potent and important rôle which Dr. Welch assigned to it, one has only to reflect that the term "medicine" now implies a great array of basic disciplines and specialties, which utilize all phases of applied science and technics and are in close touch with human activity on nearly every side. A history of physics, of

¹ Sigerist: *Kyklos*, Leipz., 1928, I. A similar survey, stressing mainly museum exhibits and medical numismatics, was made by Raphael Blanchard in 1907 (*Bull. Soc. franc. de l'hist. de la méd.*, Par., 1907, vi, 239-280).

chemistry, of mathematics, of mineralogy, geology, or astronomy, for instance, or even of such subjects as geography, naval architecture, commerce, navigation, transportation, philosophy, cookery or lace-making, will have no such broad human interest as this; for medicine, as Goethe said, "occupies the whole man because it is occupied with the entire human organism." Herein, the history of medicine is rivalled only by the history of religions, of literature, of the fine arts and of general human culture (*Culturgeschichte*). Apart from the latter, there is only one other theme of broader scope, namely the history of hygiene, which is as yet undeveloped and as Sudhoff has so cleverly and conclusively shown, starts from fundamental postulates essentially different, requires different lines of approach and attack, another sort of *flair* in exploring a given terrain and *à fortiori* very different means and methods of developing its possibilities. A bedridden human being, disabled by disease or injury, is one thing. How to lessen the possibility of such occurrences is quite another. Here, Sudhoff's great Dresden Catalogue of 1911, with its impressive exhibit of 20,394 individual objects, each a jumping-off place or *point d'appui* for separate research in the history of hygiene, was a revelation as to things undone.

It is proposed herein, not to labor the themes of Dr. Welch's address, but to sketch out a few useful lines of approach, and pedagogic devices which have suggested themselves through occasional contact with medical students and a large correspondence with research workers in need of information. To begin with, intensive study of medical history and its branches is largely a matter for mature physicians, who may have acquired the leisure and financial means necessary for acquisition of essential literature, for private study and for journeyings to European centers. For the medical student, whose business it is to learn how to practice medicine or surgery, to carry on laboratory work, to become a public health officer, to follow other details of applied medicine or sanitation, it is senseless to burden the mind with prosy lectures and

dry details about the medicine of the past. The thing has been attempted more than once and, in nearly every case, has resulted in failure or abandonment, *fiasco fiascheggiando*. If the student's time is to be taken up with this theme at all, it must be made interesting and stimulating to him at the start, by direct, personal lines of approach. Here the wonderful spontaneity, the captivating geniality and contagious enthusiasm of Osler's mentality amounted to positive genius. Whether it were Heberden's nodes or Hutchinson's teeth or Blaud's pills that came up in the clinics, he would ask point-blank: Who was Heberden? Who was Hutchinson? Who was Blaud? An eponym, a *rôle*, a method, an instrument became, as in Victor Hugo's definition of a statue, "a nudge to ignorance," not unlike Finlayson's initial question to his classes: "Did Galen write in Greek or Latin and before Christ or after?" To get adequate answers to these simple questions, by their own "original investigations," was Osler's way of inducting students into a new line of study and self-development. The essential was that one should be honest about it and do his own work. And from the simplicity of the Osler-Finlayson plan derives the best advice that can be given to students seeking counsel, *viz.*, study the subject backwards, not from Egypt and Babylon, Hippocrates or Galen, down to our own times, but the other way around, from the known to the unknown, backing into it, so to speak from the most obvious or available angle. Here, Huxley's lecture on "A Piece of Chalk" affords, as Dr. Welch once remarked, one of the most beautiful examples we have of the almost limitless possibilities of a theme suggested by a simple object at hand in every lecture-room or laboratory; a bit of crayon leads into the biology of the Foraminifera and the vast history of geological formations. Rohde's *Psyche*, Salomon Reinach's *Orpheus*, Frazer's *Golden Bough*, Adams' *Chapters of Erie*, Frobenius on Africa, Codrington on the Melanesians, all illustrate the advantages of Gaspar Becerra's lesson,² "Take that which lieth nearest," choose a terrain you know something about

² See Longfellow's poem.

to start with. How stimulating and vivifying this Osler method may be gathered from an experience related by Ramón y Cajal—the necessity of absolving a course in medical history, in one of the Spanish faculties, upon no other basis than a syllabus of the dismal medical theories of the past as a bolster for some bizarre phase of doctrine entertained by the professor himself! An equally important line of approach for students is suggested by another pathetic anecdote in the Cajal autobiography about a colleague, in the Madrid Medical Faculty, who was intimidated from publishing the results of important experimental work and lost his priority, in more than one instance, through financial inability to purchase current literature and so ascertain if his findings had already been established or confuted by other colleagues. For the medical student, there is no better preliminary course of training for future historical studies than to look up references, to read and report upon special articles in foreign or domestic journals, to learn something of the methods of indexing, classifying and abstracting the periodical literature of medicine, the abbreviations used, and the checks upon accuracy. Here Osler was again forehanded, required such things of his students and fostered a Journal Club. A foreign medical professor, recently visiting the Surgeon General's Library, commented in favorable terms upon the uniform accuracy of the references and bibliographies now found in many recent American medical books and monographs. If this tradition, deriving from the methods initiated by Billings and Fletcher in the Index Catalogue, is to be maintained, the student should be taught how to enter a reference accurately, so as to identify the author (by initials or otherwise), the title or subject of the article, the journal (by the abbreviations employed by the Surgeon General's Library and the American Medical Association), its date, volume or number, and the place of the article in it (by authenticated pagination). To know how to go about this properly is no small matter in itself, suggesting old Theodor Kullak's dictum "It is no small accomplishment in anyone to be

able to play the piano well." Here, at the same time, is a definite pathway into the literary history of medicine or (shall we say) the history of medical literature; for an accurate reference to a basic contribution on metabolism or protein sensitization is quite as important, in its way, as a reference out of Sydenham or the Hippocratic Canon, and thus, at the start, acquires heuristic value. The earlier (first and second) series of the Index Catalogue now constitute, in fact, a vast layout or scaffolding of the literary history of medicine. The third series is taken up almost exclusively with the medical literature of recent years.

Exercises in making bibliographies of special subjects, *e. g.*, of the basic contributions on valvular diseases of the heart or of the writings of prominent contributors to medical literature, will obviously be of great value to students, for it is well that the future doctor should know how such things are to be done, even if eventually delegated to his secretary. Here, as elsewhere, we may take comfort in the maxim of Sir Walter Scott: "The wise man is his own best servant."³ Bibliographical lists, perfunctorily made by a secretary, or some other hired help, are apt to be self-revealing as to inadequacy or second-hand flavor. An important phase of this kind of work is the capacity to develop, from well-arranged bibliographical lists, certain sidelights on the subject not otherwise accessible and this is particularly true of chronological arrangements of medical writings and of important events. In investigating an unexplored terrain, such as the history of acupuncture, or of town-planning or of the semeiology of an unusual disease, the surest line of approach, the most effective scaffolding, is the chronological layout, which is usually found to project from far-flung lines in the remote past, and has the additional advantage of inducing the student to familiarize himself with the commoner sources of reference. Herein, many unsuspected data may be developed, as from a photographic negative, by the mere juxtaposition of successive steps in an important investigation without reference to

³ In *The Fortunes of Nigel*.

dates, *c. g.*, in Gaskell's great memoir on the vagus nerve. Many "values" and latent possibilities in this important monograph, seemingly unnoticed or unthought of by the eminent physiologist himself, have latterly been thrown into salient relief through the confirmation of his results by subsequent investigators. This, too, is the first step toward an intelligent reading of the greater medical classics of the past, some of which contain essentially modern ideas, only expressed in the archaic language of the time, and here the finest discrimination is necessary to distinguish between what is really valid intuition and what may be "read into" the text by the reader himself. Another rewarding line of similar tendency is to encourage the student to read the more substantial sort of secular literature with special reference to its sidelights on the medicine of the particular place and period. Examples are plentiful and ready to hand. Investigation of medical details in Homer (Frölich), the Bible, the Latin poets (Dupouy, Menière), in Chaucer, Rabelais, Molière, Shakespeare and the novelists of Victorian England, is become a commonplace. An astounding array of medical data in Cicero alone has been collated in the two fair-sized volumes of Birkholz (1806) and Prosper Menière (1862). Here, the student may "take hold anywhere," from Caesar's Commentaries to the military memoirs of the World War, from Sappho to Swinburne, from the Greek dramatists to Ibsen, from Quintilian to Sainte Beuve, from *Daphnis and Chloe* to the latest novel of sorts, and with the additional advantage of improving his mind by acquainting himself with the literary classics, where he might otherwise be wasting time on some ephemeral trash of the present hour. For many years, the great Library of the Paris Medical Faculty outpaced the Surgeon General's Library in number of volumes,⁴ because the old world collection comprised full sets of the greater classics of French literature, which were included on account of the medical lore latent in them. There is hardly any literary work of magnitude which does

⁴ As distinguished from pamphlets (less than 100 pages).

not throw some light on the medicine of its period, a fact which stands out in glaring contrast with the singular conspiracy of silence about medicine and medical men only too apparent in the secular historians to date. Wells, in his "History of the World," mentions only Avicenna, but Rhodes, MacMaster and Mark Sullivan are noble exceptions.

Assuming that the pupil has now acquired ways and means of looking up subjects and getting himself interested in them, a further step would be the organization of a medical history club, preferably by the students themselves under guidance of some mentor, as at the Mayo Clinic or the Medical Schools of the George Washington and Georgetown Universities (Washington). Beginning with simple ten-minute biographical papers or extempore talks on different subjects, considerable progress can thus be made in familiarizing a class with the significance of the greater leaders, and the high spots and landmarks in the advancement of medicine. It is important, however, for the preceptor or fugleman to penetrate the minds of his fellows with the fact that such contributions are, in the very nature of things, ephemeral and otherwise hardly "fit" for actual publication. Papers on Hippocrates, Harvey, Sydenham, Jenner—these themes have been handled scores of times. With an eye to the great avalanches of medical literature now descending upon us, the inculcation of the *nonum prematur in annum* at the start is highly desirable. The main object of the students' medical history club should be to cover the essential landmarks in the progress of medicine in a way that might be interesting and profitable to themselves. Supplementary to these evenings, a series of lantern slides, arranged as a movie by a recent mechanical invention, can be utilized to bring out the main lines of the general subject and the special history of each important discipline and specialty, say of physiology or otology or obstetrics, at the end of the courses. This virtual review of the special subject from the historic angle (by appropriate legends) holds out a distinct advantage over the perfunctory oral lecture, since

what is taken in at one ear usually goes out by the other, while whatever rivets the attention or stirs the imagination by the visualizing process is apt to stick in the mind somewhere and be retained. Such a movie, moreover, can be manipulated by the janitor, if need be, as a lecture that delivers itself. To prepare an effective scheme of visualization with legends, so that the essential facts in a course, say on physiology of the circulation or diseases of the nervous system, shall be reviewed and fixed in the mind by the historic milestones, implies *expertise* and might be a fascinating task for an expert or group of experts. Another matter which can be brought to the attention of students is the advantage of maintaining an interest in the subject through some particular hobby, such as collecting medical classics, incunabula, engravings, caricatures, medals, postage stamps, book-plates, autographs, manuscripts, autograph letters, portraits and personal mementoes of great physicians, specimens of primitive plastic anatomy and pathology, medical amulets, talismans, scarabs, and apotropaic tokens, *ex voto* offerings, primitive remedies and other cultural illustrations of the history of medicine. The Pagel, Payne, Streeter and Osler collections are salient examples of what can be done in the way of book collecting, yet even more might be accomplished, with particular reference to the less expensive but no less valuable pamphlet classics and reprints of important papers, if one begins early. Many such items will be quite within the financial means of students who have the enterprise and the patience to rummage in antiquarian bookstores in the spirit of Goethe's dictum, that the purchasable paintings of to-day, if real values, will acquire, in due time, the prohibitive prices attaching to old masters. Medical numismatics and philately, in particular, are attractive and nowise expensive lines for students, and of considerable heuristic moment. A good instance of the teaching value of medical medals is afforded in the plaque recently struck off in honor of Professor Jeanselme, the present occupant of the chair of medical history in the Paris Medical Faculty. The obverse of this medal shows

the old Hôpital St. Louis, with the legend *Laborantibus vel ex cute vel lue vel lepra Nosocomium*; in other words, syphilis, of old time, was frequently confused with leprosy, psoriasis or other cutaneous eruptions and hence not recognized as an individual disease, even when yielding to mercurials, which is the key to the puzzling problem of its early history. The obverse of the medal of the Royal College of Surgeons shows Galen studying the robber's skeleton by the mountain-side—one of his few real contacts with human anatomy. The German nautical medals of the World War period are all featured by well-executed skeletons, as symbols of Death. The medical medals of the Paris Mint (*La Monnaie de Paris*) are the work of the most talented numismatic artists of France and can still be had at very reasonable prices. Replicas of Greek coins, illustrating the beginnings of descriptive biology (animals and plants) and the ancient medical shrines, are manufactured at the British Museum, and reproductions of Pompeian and other ancient surgical instruments at Magdeburg. Beautiful plaster of Paris reproductions of antique votive tablets, statues and busts of Im-hotep and Æsculapius, and bas-reliefs illustrating the Æsculapian cult (*Heros Iatros*) are obtainable from the Gyps-Fabrik of the Berlin Museum, and Maltese specimens of palæolithic anatomy from the Hon. T. Zammit, The Museum Vallita, Malta. Students sojourning in Mexico, Central and South America, Africa, Oceania or the far East may have opportunities to pick up specimens of primitive amulets, apotropaic objects, primitive plastic anatomy or of pathological delineation by natives *sans le savoir*. It may not be long before such objects become scarce and difficult to obtain, even as national costumes are disappearing in Spain and other parts of Europe or as natives of Tahiti or Luzon are adopting the *traje blanco*. The "convulsion-clock" of Moravia, which was wound up with the idea that an infantile spasm would terminate as it ran down, is in fact, no longer obtainable. The handsome hard-wood book-stands carved by Igorots around Baguio (Philippines), illustrating their skill in delineating ethnic (constitu-

tional) anatomy, have gone up in price. This is also the case with the scapulary-amulets and *ex-voto* objects of Central Europe, of which Elizabeth Villiers made such a remarkable collection. No doubt such things might be manufactured wholesale by machinery, like the porcelain netsukés of recent Japan, were there any great demand for them in commerce, but they would never have the authentic interest attaching to the *bonafide* hand-made article.

When the students have become fairly familiar with the names of the great leaders of medicine, what they stood and stand for, it is advantageous to give a library demonstration of the basic texts and medical classics associated with these names, similar to those inaugurated by Billings at the Johns Hopkins Hospital in 1889-90 or by Finlayson at Glasgow. Here, the Catalogue of Historical Texts in the Surgeon General's Library (*Index Catalogue*, 1912, 2. series, xvii, 89-178), or the Syllabus and Specimen Extracts prepared for his classes by Professor John C. Comrie (University of Edinburgh) will be of immediate help. While it is expecting too much that the lines of approach indicated above should, all of them, be tried in a given year or semester, or even in the entire period from matriculation to graduation, yet, by dint of a little perseverance and ingenuity, enough can be interpolated here and there to give the student a fair vista of the history of his future profession. The main thing is that it should be made fascinating, stimulating, inspiring, the reverse of boresome or burdensome, and this will depend upon the personality and mentality of the professor or instructor delegated to carry on such work. It goes without saying that he should be, not a "dead one," a "fossil," a "stuffed shirt" or a "flat tire" but a "live wire," a teacher of the active, going, Osler type, informed with that just perception of the needs and temperamental handicaps of youth which is possessed or acquired only by true men of the world. Osler, Hare tells us, "went into the post-mortem room with the joyous demeanour of the youthful Sophocles leading the chorus of victory after the battle of Salamis." The essential thing is adherence to the simple Osler

plan: Bence-Jones urine, say you? who was Bence Jones? Percussion; who originated it? Did he describe it as an invention or a discovery? How does an invention differ from a discovery? Who first discovered and described pectoriloquy? the succussion sound? ægophony? Cheyne-Stokes respiration? Who invented the stethoscope? Who were his contemporaries? What important American physicians were trained in Paris at this time? Why was Paris the great center of surgical teaching in the 18th century and of internal medicine in the Napoleonic period? Questions such as these, leading from one gain in knowledge to another by easy steps, are obviously the very best way of reviewing the essentials of any branch of medicine and can be made to hold the attention of students if the personality of the teacher is engaging and stimulating; and then, too, they may haply be the initiation of some students in the difficult art of using their own minds, of thinking for themselves, of dealing with ideas *quâ* ideas. That, at any rate, was the essence and aim of Osler's teaching in his Baltimore period. At this point, an utterance of William Warner Bishop, the able librarian at Ann Arbor, is still apposite and worth quoting:

"Without a sense of the historic setting of his work a man is almost as hopeless as is the man who lacks a sense of humor! You cannot argue with the one or the other. In fact, I dare go further and affirm that only by the combination of the historical and the experimental methods can any work of first rate importance be produced in any field of knowledge."

A fortiori, the historical review is the very best mordant to fix the basic facts and principles of the different medical disciplines and specialties in the minds of students. While this is not necessarily the case in teaching mathematics or mineralogy or navigation, a sufficiency of experience goes to show that, with some medical students, the historic data, if early engagingly presented, do "make incision in the memory." For most students, there is still truth in the old German proverb: *Was Hänschen nicht lernt, lernt Hans nimmermehr*. At the Baltimore Institute, the main line of endeavor will, of course, be post-graduate instruction in methods and lines of advanced research work, and here,

apart from such teaching as that of Pagel in Berlin, Sudhoff in Leipzig, Singer in London or Miller in Milwaukee, "the echoes have been many and the voices few."⁵ In other words, apt pupils are as difficult to find as efficient teachers, and there has been little or no organization of preliminary studies incident to advanced work. Palæography, for instance, the approach to a crabbed undecipherable, papyrus or manuscript, whether in cursive uncial, majuscule or minuscule Greek or contracted Ducange Latinity, the script of later centuries, or what is now pondered by court-room experts in chirography, is as definite and orderly a procedure as the conduct of a physical experiment or the steps in analyzing an unknown chemical substance. It is taught at the *Ecole nationale des chartes* (Paris), in a course of three and one-half years, restricted (it is said) to 20 pupils, and with a degree and diploma of *Archiviste paléographe*. Instruction is also given in the larger European Universities. An outstanding exponent within our profession is Wickersheimer, who has catalogued the MSS. of the Library of the University of Strassburg. The pathway into the study of medical manuscripts is, of course, the study of the early printed books. The science of the medical incunabula was initiated by Sudhoff and the first exhaustive study of the entire known material, by and large, will be that undertaken by Klebs and himself. Introductory studies of the German medical incunabula by Sudhoff (1908) and of the 15th century pest-tracts by Klebs and Sudhoff (1927) have already been printed. The pathway into the medical incunabula is the study of the medical classics of classical antiquity and Byzantium, with an eye on the Islamic literature, the Du Cange *Glossarium mediae et infimae latinitatis* (Paris, 7 v, 1840-50; *Glossaire françois*, 2 v. Niort, 1878-9) and the catalogues of incunabula. A *Primer of Mediaeval Latin* (a good anthology) by Charles H. Beeson was published in 1925. Apart from such main lines as these, there is immense amount of work to be done in the mere testing, correcting and ultimate

⁵ Goethe.

ascertainment of innumerable dates and data in the general history of medicine, particularly American medicine. The individual medical histories of a number of the Western States are now in process of intensive study by investigation of the records of the State Historical Societies. The recent study of Knight and Zeuch on the old 17th Century portage areas, over which Fort Dearborn (ultimately Chicago) was built, with Zeuch's own subsequent *History of Medical Practice in Illinois* (v. 1, Chicago, 1927) are cases in point. As far as the history of American medicine is concerned, this is the most important departure of recent years. Much remains to be done for the Eastern, Southern and far Western States. The best lines of planning and execution will probably be learned from those prairie and Northwestern States which have recently acquired an historic background. This phase, as being archival, is necessarily dry and, in the main, of local interest only; but upon such records are based such excellent narrative records of the total subject as those of Mumford and Packard (now in process of revision). The main sources have been the earlier investigations of Thacher, Gross, Billings, Toner, and for individual states and cities, those of Massachusetts (Green, Burrage, Harrington, Farlow), Maryland (Cordell), New Jersey (Wickes), Ohio (Juettner, Handerson), Indiana (Kemper), Iowa (Fairchild), New York (J. J. Walsh), Missouri (Goodwin, Outten, H. W. Loeb), Kentucky (Drake, Gross, McCormack), California (Bard), Nebraska (von Mansfelde, Cutter), District of Columbia (D. S. Lamb), Philadelphia (Henry, Ruschenberger, Norris), Chicago (Hyde, Weaver) and Milwaukee (L. F. Frank). The more picturesque data, such as the Winthrop journals and inoculation protocols of Massachusetts, have long since been exploited. The *afficionado* of advanced research work on the American terrain is, in fact, not unlike the literary aspirant in *Life*, who after studying everything from printers' marks to rhetoric, from Beowulf to Browning, from Gilgamesh to Joyce's *Ulysses*, settles down in a hall bedroom, pen in hand, against the conundrum: "What the

hell shall I write about?" But, eliminating the dubious prospects of coin and *kudos*, all this is illusory. The success of Sudhoff's teaching was largely due to the simple proposition that the definite settlement of any fact or date is of infinitely greater consequence than sensational writing, florid eulogy or dull repetitions on Hippocrates, Paré or Sydenham. It takes much more time, labor and trouble to get facts, dates and references accurately recorded than to write the book containing them and, as stated, an immense amount of work remains to be done in the definitive settlement of basic data. There could be no better national repository and public *Archiv* for such records than the Baltimore foundation.

At the close of his address, Dr. Welch stressed the humanistic aspect of medical history, in other words, the humane side of medicine, as the most important of all. The power of medicine as a civilizing medium is, in fact, only just coming to be realized. A fair index of the stream of tendency is afforded in President Lowell's dictum that in the 17th century, a conquering nation strove to change its neighbors' religion, in the 18th their commercial relations, in the 19th their laws and in the 20th their drainage. The sanitary improvements effected by the U. S. Army in Cuba, Porto Rico, Panama and the Philippines are good cases in point. American policy in the Philippines, in particular, is one of the most significant, expensive and altruistic experiments in social welfare yet attempted. The enlarged concept of social medicine, as a main coefficient in social welfare, was one of the principal outcomes of the World War. Its main lessons were acquired from the team-work and group-methods necessary to the administration of military medicine and sanitation on a grand scale, and from this *aller droit au but* derives, perhaps, the aggressive stand taken by some of its protagonists. Yes, even a decade before the close of the European War, Kellie had already stressed the growing importance of the doctor in a newer world of "many inventions," sudden, unforeseen emergencies and "change become inevitable."

"There are only two classes of mankind in the world—doctors and patients. Every sane human being is agreed that this long-drawn fight for time that we call life is one of the most important things in the world. It follows, therefore, that you, who control and oversee this fight, and who will reënforce it, must be among the most important people in the world, . . . In all times of flood, fire, famine, plague, pestilence, battle, murder and sudden death, it will be required of you that you report for duty at once, that you go on duty at once, and that you stay on duty until your strength fails you, or your conscience relieves you, whichever may be the longer period. . . . Have you heard of any legislation to limit your output? Have you heard of any bill for an eight-hour day for doctors? Do you know of any change in public opinion which will allow you not to attend a patient when you know that the man never intends to pay you? Have you heard any outcry against those people who can really afford surgical appliances and yet cadge around the hospitals for free advice, a cork leg or a glass eye? I am afraid you have not. It seems to be required that you must save others. It is nowhere laid down that you must save yourselves. That is to say, you belong to the privileged classes. . . . You and kings are about the only people whose explanation the police will accept if you exceed the legal limit in your car. On presentation of your visiting card, you can pass through the most turbulent crowd unmolested and even with applause. If you fly a yellow flag over a centre of population you can turn it into a desert. If you choose to fly a Red Cross flag over a desert you can turn it into a center of population toward which, as I have seen, men will crawl on hands and knees. You can forbid any ship to enter any port in the world. If you think it necessary to the success of an operation in which you are interested, you can stop a 20,000 ton liner with mails in mid-ocean till the operation is concluded. You can tie up the traffic of a port without notice given. You can order whole quarters of a city to be pulled down or burnt up, and, you can count on the warm coöperation of the nearest troops to see that your prescriptions are properly carried out. . . . You have been and always will be exposed to the contempt of the gifted amateur—the gentleman who knows by intuition everything that it has taken you years to learn. You have been exposed, you always will be exposed to the attacks of those persons who consider their undisciplined emotions more important than the world's most bitter agonies—the people who would limit and cripple and hamper research because they fear research may be accompanied by a little pain and suffering. But you have heard this afternoon a little of the history of your profession. . . . You remain now, perhaps, the only class that dares to tell the world that we can get no more out of a machine than we put into it; that if the fathers have eaten forbidden fruit, the children's teeth are liable to be afflicted.⁶ Your training shows you that things are what they are and the consequences will be what they will be, and that we

⁶ An amateur might regard this Biblical allusion as a foreboding of Hutchinson's teeth, but, as Jacobi used to say, "it remains for him to prove it."

deceive no one but ourselves when we pretend otherwise. . . . At a time when few things are called by their right names—when it is against the spirit of the times even to hint that an act may entail consequences—you are going to join a profession in which you will be paid for telling men the truth and that every departure you may make from the truth you will make as a concession to man's bodily weakness and not mental weakness."

Much water has flown under the bridges since this pronouncement, which now sounds a bit late-Victorian. With the close of the World War, the family doctor's progress became recessional; venery, as distinguished from veneal diseases, came to be a matter of universal discussion and fanciful portraits of the greater leaders of medicine have been used to advertise drugs and surgical appliances. The total failure of the late Dr. Meltzer's Medical Brotherhood for the Furtherance of International Morality goes to show, moreover, that medicine is to date as far from being an efficient agency for promoting international peace as the law itself. Intensive study of the history of medicine is intended for doctors alone, just as the history of hygiene and sanitation, when it comes to be written, will have a definite appeal to the general public. Such studies, if carefully differentiated and kept apart, will always tend to diminish our pride, in the realization of the thousand-fold labors and vast stretches of time required to lift the doctor to his present social status and bedside medicine to its now commendable estate.

F. H. GARRISON.

THE COMMON AFFECTIONS OF THE COLON, THEIR ORIGIN AND THEIR MANAGEMENT

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A review of 2500 case histories of private patients with digestive troubles living in and around New York City shows approximately the following distribution of the more common affections of the colon:

Constipation	500 cases per thousand
Common anomalies (redundant colon, low cecum)	of each 200 cases per thousand
Colonic irritability ("simple colitis" including "mucous colitis" and diverticulosis)	200 cases per thousand

Next in order are:

Colitis gravis (including "ulcerative colitis")	9 cases per thousand
Carcinoma	6 cases per thousand

In other parts of the world or in other types of practice, one would encounter the specific dysenteries in varying degrees of frequency, viz.:

- Bacillary dysenteries, epidemic and endemic
- Protozoal dysenteries, amebic and flagellate, as well as the chronic non-dysenteric forms of protozoal infestation, and
- Tuberculosis.

Until quite recently, the terms constipation and diarrhea were employed to cover almost the whole range of disturbed colonic physiology. No condition was regarded as worthy of serious consideration unless dignified by the presence of an advanced organic lesion. Nowadays, the ever increasing clinical application of the Roentgen method of study has changed all this, and one can follow almost a whole gamut of functional alterations from early irritability to complete colonic decompensation.

ORIGIN AND FREQUENCY OF THE COMMON AFFECTIONS OF THE COLON

The common affections develop as a result either of a congenital anomaly of the colon or of an instability of its autonomic control or from an interplay of both factors. When it is realized that perhaps one-fifth of all patients

an actual physical cause preventing the consumption of normal amounts of food, such as an obstruction in the digestive pathway, or a painful lesion which causes fear of eating. In many individuals, however, various articles of diet are progressively eliminated in an awkward attempt to cure the very constipation that is aggravated by the process. Obviously, the remedy for this state of affairs is the early restoration of an enlarged and balanced dietary.

It is a matter of common knowledge that certain individuals habitually omit from their diet those foodstuffs possessing inherent qualities of increasing intestinal peristalsis. Such foods include the vegetables and cereals with cellulose residues which stimulate peristalsis chiefly by mechanical means; the fruits which also act mechanically, as well as by the presence of cathartic sugars, acids and salts; the sugars themselves; and the fats which act both chemically and mechanically.

For some reason that I have never been able to understand, milk is commonly believed to be constipating. In my experience, raw sweet milk seems to have rather a beneficial laxative effect in some mild cases of spastic constipation. It is to be recommended in malnutrition even if associated with constipation, but must be avoided in all forms of frank colitis.

4. *Psychic and Nervous Factors.*—The importance of psychic factors in constipation can hardly be exaggerated. Ever so many people know from experience that they cannot possibly have a bowel movement when nervous or worried, or while actively engaged in the ardent pursuit of their daily occupation. Even mild excitation, such as that associated with travel and change of environment, is a potent cause of constipation in susceptible individuals, as are, of course, the grosser emotions of fright and anxiety.

One of the peculiar facts in connection with constipation is the concern with which some individuals regard their

failure to secure a daily bowel movement. Not only may an occasional omission be perfectly explicable on the basis of some of the causes just mentioned, but it may even be regarded as well within normal limits if it is not associated with physical discomfort or disability. Unfortunately, these apprehensive individuals only too often develop either a vicious bowel habit or an apprehension neurosis or both conditions.

Fatigue may also be considered under the head of nervous factors. A sufficient degree of general bodily rest and relaxation is essential to the proper functioning of all the organs; and the bowels form no exception to the rule. Whether or not the fatigue products of metabolism are actually constipating, it is nevertheless certain that many cases of costiveness are associated with insufficient rest, and particularly with insufficient sleep. This is very often the case with those who work at night.

5. *Vicious Habit Formation*.—Perhaps the greatest perpetuating cause of constipation is vicious habit formation. Much of the trouble is due to early neglect of the bowels. Getting up too late before rushing to school, shop, or office, and later neglecting the call of nature because of preoccupation, laziness, or embarrassment, have frequently been pointed out in this connection. To this should be added the uninviting condition of toilets in the poorer types of schools, shops, farms, and tenements—conditions that demand remedy at the hands of the appropriate social, educational, or administrative authorities.

Once the chain of regular bowel evacuations is broken, once the fecal stasis begins to cause discomfort, it is but a short step for the sufferer to seek artificial methods of relief. He embraces thenceforth either the cathartic or enema habit or both, and his constipation bids fair to remain fixed for life. Physicians, too, have not been without blame in this matter. A prescription for a cathartic, no matter how well fitted to the temporary needs of a patient, may become just as persistently used as any patent medication.

VARIETIES OF CONSTIPATION

Although it is necessary to distinguish several different forms of constipation, it should be stressed that pure forms are rare, and that spasm is a common factor in practically every variety of constipation. The following types may be distinguished for purposes of discussion:

1. *Atonic Constipation*.—This is the variety commonly found in asthenic and malnourished individuals. A congenital intestinal atony or hypoplasia is sometimes assumed to exist in these cases. Atonic constipation may also occur as an end result of long-continued abuse of



FIGURE 1

cathartics and enemas. It may be limited to the proximal colon, particularly in cases of marked spasm of the distal large intestine. (Figs. 1 and 2.)



FIGURE 2

2. *Spastic Constipation*.—This, perhaps the most common variety of the disease, is often associated with the other forms, as was just mentioned. The distal part of the gut is the portion usually involved by the increased tonus, the condition affecting either the entire colon from the hepatic flexure onward, or certain special areas such as the descending colon, the pelvic colon, or the anal sphincter alone. In the last named instance, local lesions may play

an exciting rôle (fissures, ulcers, and hemorrhoids). When spastic constipation is associated with atony of the proximal large intestine, the cecum, ascending colon and transverse colon act as reservoirs for large accumulations of feces which are passed, small portions at a time, beyond the contracted areas. Clinically, this condition may be associated with daily, but quite insufficient evacuations.

The common symptoms of spastic constipation are abdominal cramps, generally localized in the left lower quadrant, often increased by defecation, and still more by catharsis; peristaltic unrest; and the passage of small stools, hard and lumpy in character (marble or sheep-dung stools). Examination of the left lower quadrant often reveals a tight cord corresponding to the iliac colon. The ceco-colon is often distended, gurgling and tender. The anops may feel tight to the examining finger, while inspection of the pelvic colon with the sigmoidoscope often reveals the presence of an irritable condition which may prevent the introduction of the whole length of the instrument.

3. *Dyschezia*.—In some cases of constipation, it is found that the rectum is practically always filled with feces. Study by means of the Roentgen ray shows that there is no delay in the progress of the stool through the proximal colon. In other words, we are dealing with a condition in which that portion of the gut charged with the actual act of defecation fails to function. The pathogenesis of this disorder, known as dyschezia, has been described by Hurst as follows: "The habitual neglect of the call to defecation leads to the accumulation of the feces in the rectum and pelvic colon which gradually become more and more distended. The distention diminishes the tone and impairs the contractility of the musculature; as the force required to empty the rectum when over-distended with feces is much greater than that required to empty it under normal conditions, the weakened muscular coat is incompetent to do its work, and, even if a greater effort be made, the evacuation remains incomplete. In time, the muscu-

lature of the pelvic colon and rectum may become so profoundly atonic and paretic that it can never be restored to its normal condition." Dyschezia may also develop secondarily to any condition which causes pain during defecation, such as inflamed or thrombosed hemorrhoids, anal ulcers or fissures, and pelvic peritonitis. In women, the condition is frequently caused or aggravated by childbirth.

4. *Constipation with Redundant Colon.*—This will be discussed in the section on the redundant colon.

5. *Constipation with Mucous Colitis.*—This will be discussed in the section on the irritable colon.

DIAGNOSIS OF CONSTIPATION

The diagnosis of constipation may be made from the history, the physical examination, stool inspection, and Roentgen examination.

The history is usually straightforward. The patient complains that he has less than one stool daily, or that the feces are hard and the total output small. Occasionally, however, the story is misleading in that, despite a daily movement, the actual output may still be insufficient to empty the colon adequately, according to the best objective standards. Such cases may be designated "masked constipation."

Physical examination is performed by abdominal palpation and by rectal touch. By the former method, a contracted or knotted and usually tender iliac colon may be rolled over the left iliac fossa in cases of spastic constipation. In dyschezia, a rectum filled with hard scybala may be discovered by the gloved finger. If the sphincter ani is very painful, the rectal packing may be determined in women by vaginal investigation.

Stool inspection reveals at once any departure from a normal bowel movement. Unfortunately, the criteria of a normal bowel movement do not be as well

known as they should be. The amount of stool evacuated daily should represent a fecal column reaching from about the mid-descending colon to the rectum. This column is generally broken up into segments of the size and consistency of frankfurter sausages. A stool of normal formation contains about 75 per cent water. There is no mucus, blood, or pus. In constipation, the amount of feces expelled daily is small, the form is lumpy, the consistency hard. Fresh blood is occasionally present from bleeding fissures or piles. Mucus may also be noted.

Roentgen examination gives the most comprehensive evidence as to the presence of constipation, and the existing variety. The ideal procedure is to administer an opaque meal and see what happens to it. No cathartics or enemas should be permitted during the course of the examination unless a rectal impaction appears imminent. Observations should be made daily with the X-rays until the barium is completely and spontaneously evacuated from the rectum. Under normal conditions, the colon is empty at 48 hours, or between that observation and the next at 72 hours. In order to complete the study by observing the exact course and extent of the colon, an opaque enema is administered.

TREATMENT OF CONSTIPATION

Owing to lack of space, only the chief principles of therapy will be presented in schematic form as follows:

1. Prophylaxis should provide for regular food intake, for routine visits to the toilet, sufficient water drinking, especially on arising, and a balanced dietary containing sufficient roughage.
2. Visceroptosis and malnutrition should receive appropriate attention. Abdominal support and a fattening diet are indicated. For the latter, butter and olive oil are particularly to be recommended.
3. The psychic and nervous causes of constipation should be controlled as much as possible by appropriate

mental and emotional hygiene, by adequate vacations, rest, and sufficient sleep, and by sedative medication. Small doses of chloral and bromide may be effectively prescribed over long periods of time.

4. Vicious bowel habits should be broken up by the immediate and complete withdrawal of cathartics and enemata. The period of waiting for the resumption of spontaneous bowel movements is often a most trying one for physician and patient. It is always best to combine the withdrawal treatment with a Roentgen study, especially for psychological reasons.

5. Atonic constipation should be treated by careful, not abrupt stimulation, with gradually increasing amounts of roughage added to a basically smooth diet. Agar and psyllium seeds are of value.

6. Spastic constipation should be treated by rest, sedatives, lubricants, and antispasmodics. The oils may be administered by mouth or by rectum. For rectal use, a small hand syringe works admirably. In cases of spasm limited to the lowermost colon, a course of local applications of magnesium sulfate through the proctoscope, as advocated by Soper, is beneficial.

7. Dyschezia should be treated by local measures directed systematically to the rectum. Local lesions should receive appropriate attention. Otherwise, small water injections, retention oil enemata, or suppositories are indicated. In some cases, a course of rectal dilatations, as with Wales bougies, may be helpful.

8. Cathartics have no place in the routine treatment of constipation. Being habit forming drugs, they increase the evil instead of relieving it. Their use should be reserved to special occasions where purgation is deemed advisable, as well as to the care of the very aged and of those suffering from certain chronic diseases. Cathartics may also be of use temporarily, in the case of patients who are bed-ridden from any cause. The mildest

in the smallest effective dose is the rule for all such medication.

9. Irrigations likewise do not cure constipation. If they are deemed of value for some ulterior purpose, it must be borne in mind that they accomplish their end at the expense of normal colon function.

COMMON ANOMALIES OF THE COLON

Clinical Significance of Anomalies.—Anomalies of the colon are a distinctive expression of organic constitutional inferiority of the digestive tract. They are of importance clinically because they are frequently encountered, and because they represent points of weakness in the large intestine which predispose their bearers to colonic malfunction. Congenital anomalies may cause symptoms in all their owners some of the time, in some of their owners all of the time, but are under no obligation to cause symptoms in all of their owners all of the time. In other words, although the colonic malformation may not become manifest under ordinary favorable conditions of existence, it does attract attention as soon as the subject is exposed to physical or emotional strain, to wasting disease, or to trauma such as surgical operation or childbirth. In general, the tendency is for the organism as a whole to compensate for the presence of a congenital deformity; and it is only when this mechanism breaks down that symptoms arise. This explains the late onset of complaints in many cases. The most common exciting causes of bowel decompensation have just been mentioned. Underlying contributing causes are improper diet, bad hygiene, and vicious bowel habit formation.

THE REDUNDANT COLON

The most common congenital anomaly of the large intestine is the redundant colon. It was encountered in almost 19 per cent of a series of over a thousand patients (1927 figures). The redundant colon occurs more often in men and in the sthenic habitus. It is, as the name implies, a condition of congenitally increased colonic length. The

redundancy may take the form of simple pleats or reduplications or of extensive loops and twists. A simpler form is that of kink or angulation. The most frequent site is the pelvic colon. The condition may be familial or hereditary. (Figs. 3 and 4.)



FIGURE 3

Symptoms.—The symptoms associated with redundant colon are constipation, pain, and gas distress. The acute discomforts are generally ascribed to the development of spasm from irritation at the site of the redundancy. In this connection, one should be careful to avoid thinking of a kink or loop as a fixed or static barrier, such as volvulus or stricture. It is true that a loop may become

partially twisted by overloading with gas or feces, but the resulting symptoms of relative obstruction persist only as long as the original factors obtain; and those are usually transient. In other words, we are dealing with neither an organic nor a functional condition, pure and simple;



FIGURE 4

but rather with a combination of both that seems to be characteristic of congenital malformations of the digestive tract in general.

The constipation of colonic redundancy often dates back to childhood. The interval between spontaneous bowel movements may extend from three days to a week or more.

There is often discomfort in the lower right quadrant, characterized as dull, dragging, or sticking in nature, and increased by bodily exertion. Not infrequently there is gas pressure, fullness or pain referred to the exact location of the redundant loop in the left colon. Sometimes precordial distress or increased belching is provoked by gas accumulation under the left diaphragm. The passage of flatus is at times difficult, but when it does take place, is often followed by complete relief of symptoms.

Diagnosis.—The diagnosis of colonic redundancy by physical examination of the abdomen is practically impossible. Similarly, rectal palpation reveals no fecal accumulation, for the delay is invariably above the pelvi-rectal flexure. It is only by careful Roentgen study, both by barium meal and by opaque enema that the existence and the extent of the anomaly can be accurately determined. The enema reveals the exact site and form of the redundancy; the opaque meal shows what it does to give the patient symptoms.

Treatment.—The first step in the treatment of redundant colon (after an accurate estimate of the situation by the methods just mentioned) is the restoration of colonic function. This is all the more important because patients often suffer more from their own ill-advised interference than they do from the underlying condition. The withdrawal of irritating cathartics should be immediate and complete. They serve only to increase the colonic irritability and decompensation. As a matter of fact, enemata may be quite ineffectual in this condition, either because they fail to reach the affected bowel segment, or because, once administered, they become more or less completely "lost" in the long, tortuous, and atonic colon. In some of my cases, 80 to 90 ounces were required to reach the cecum, the normal colonic capacity being 38 ounces. Violent purges are actually dangerous, as, in my opinion, they may produce volvulus, a condition that can only occur in a redundant colon.

Once artificial aids to bowel movement are eliminated—and this may involve considerable tact as well as firmness in the case of some individuals—it is only a question of a few days before the colon builds up enough reserve to begin producing spontaneous stools. These movements, small at first, tend steadily to gain in bulk as time goes on. The further management of the condition does not differ essentially from the general treatment of constipation as already outlined. On the whole, the therapy may be described as conservative and protective. A bulky but not too rough diet is best suited to stimulate effective peristalsis, and forced water drinking is generally necessary to prevent undue drying of the feces.

Lubrication from above and below is very often required, and helps particularly to overcome the associated colonic spasms. It is generally necessary to continue this form of treatment for a long period of time. The patient's co-operation in keeping a careful "stool record" is a real contribution toward a successful outcome. Belladonna in increasing doses is useful when the spastic tendency is excessive.

Although it is not absolutely essential for the bowels to move daily, and a total of 5 or 6 stools a week may be compatible with a very fair degree of comfort, it is well to be on the lookout for gradually accumulating fecal retentions. To overcome these, an occasional thorough but non-irritating colonic irrigation, or else a single dose (1½ ounces) of castor oil may be all that is needed. Only if the above measures fail is a compromise with the cathartic habit justifiable. None but the mildest laxatives should be selected, such as cascara or phenolphthalein; and these should be given, as always, in the smallest dose compatible with satisfactory action.

Surgical intervention is to be reserved for cases of volvulus only.

THE LOW CECUM

Almost as common as the redundant colon is the anomaly known as the low cecum. It occurred in almost 18

per cent (revised figures) of my cases. This condition is the result of over- or hyper-descent of the cecum during the intra-uterine development of the colon. Normally, the cecum is unattached, whereas the ascending colon is fixed to the posterior abdominal wall. When the ascending colon is provided with a mesentery, the mobility of the cecum is correspondingly magnified. The resulting condition has been described as "cecum mobile." On the other hand, when the normal fixation of the ascending colon is continued downward, the cecum becomes fixed in its turn to the posterior abdominal wall. If, in addition, there is hyperdescent, we may speak of a "low, fixed cecum."

Symptoms—The low cecum occurs most often in women and in individuals of the asthenic habitus. The symptoms associated with this condition are either systemic, being strikingly those of so-called autointoxication—namely, nausea, vomiting, and headache; or else they are local, giving rise to pain or discomfort in the right lower quadrant. As with other congenital anomalies, the symptoms may be absent, the patient being merely predisposed to these special forms of malfunction.

The tendency to vomit is a striking characteristic of patients with low ceca. Such individuals seem to constitute the "easy vomiters" of ordinary experience. Some of them have frequent vomiting bouts from relatively slight causes, such as dietary indiscretion or emotional stress. Others have more severe attacks with sick headaches, so-called bilious attacks. In women, these occur more often during the menses. Many patients suffer from trainsickness and carsickness. The cause of vomiting and headaches is not quite clear. It may be due to a drag of the entire right colon across some part of the duodenum, causing a temporary block with transient duodenal stasis.

The right-sided abdominal pain occurs in about one-half of the patients with low ceca. It is either dull, dragging in nature and constant in occurrence, or else it comes in attacks of colic, sometimes (though by no means always) associated with vomiting. Although tenderness over the

distended and gurgling cecum is commonly present, rigidity and fever do not enter into the clinical picture. Despite this, the diagnosis of "chronic appendicitis" has been freely made in this condition. Indeed, over one-fifth of my series of patients with low ceca have had an appendectomy without (except in the rarest of cases) experiencing any permanent relief of symptoms.

Diagnosis.—The diagnosis of low cecum is best made by Roentgen observation nine hours after a barium (opaque) meal. An opaque enema is less satisfactory in revealing this condition. (Figs. 5 and 6.)



FIGURE 5

Treatment—The treatment of patients with low cecum should embrace the following items and considerations:

1. Rest—physical, nervous, and mental.
2. Fattening cure with abdominal support to restore normal intra-abdominal pressure and to overcome the asso-



FIGURE 6

ciated ptosis. The position of the cecum, however, is not often altered by medical treatment.

3. Improvement of colon function. The idea is to clear the track ahead and prevent backing up in the proximal colon with resultant increased dragging in that region.

It should be pointed out, however, that gross stasis has not been demonstrated to occur more frequently in low than in normal ceca.

4. Antispasmodics, such as belladonna, and general sedatives, such as repeated small doses of bromid and chloral, or codein.

Surgical therapy.—Removal of the appendix is futile. More radical procedures devised to improve the position of the cecum and to fix it, if movable, though theoretically less objectionable, are perhaps unnecessary, except in rare cases of actual volvulus of the cecum.

COLONIC IRRITABILITY (SIMPLE COLITIS)

Definition.—The syndrome of the "irritable colon" is an extremely useful concept. Broadly speaking, colonic irritability is characterized by instability of function in the absence of a gross colonic lesion. The condition seems often to be congenital in origin. It has also been described under the name "simple colitis," using the term much as one designates the common cold, "rhinitis." This simple functional irritability is to be distinguished from those severe forms of colonic disease, perhaps more properly called "colitis" which are always associated with definite local organic changes resulting from trauma, infection, new growth, intoxication, or parasitic infestation. Finally, it should be borne in mind that an irritable colon may at times develop into a true organic colitis, and that, on the other hand, an organic lesion is practically always accompanied by some degree of irritability.

The pathologic physiology of the irritable colon is somewhat similar to that of the irritable stomach, being characterized by:

1. Hypertonicity, i. e., frequent and irregular spastic phenomena which may co-exist with more or less localized stasis. The term "spastic colitis" is sometimes used to designate this phase of colonic irritability.

2. Hypermotility, as evidenced roentgenologically, and clinically by the passage of mushy and watery stools, generally, though not necessarily with increased frequency.
3. Hypersecretion of mucus. This is generally regarded as a local protective mechanism.

The underlying causes of colonic irritability are, in order of their clinical importance:

1. Instability of the involuntary nervous system, often described as "vagotonia," "spasmophilia," "endocrine imbalance," etc.
2. Constipation and the abuse of cathartics, enemas, and irritating irrigations, particularly.
3. Organic lesions of the colon.
4. Gall-bladder disease.
5. Gastrogenous factors, such as achlorhydria, improper diet.
6. Disturbances of the small intestine, including certain rather ill-defined intestinal dyspepsias; also pancreatic insufficiency.
7. Pericolitis, due to extraintestinal irritation from adhesions, pressure, etc.
8. Remote lesions outside the digestive tract acting reflexly on the colon by way of the involuntary nervous system. Possible examples are "focal infections" in teeth, tonsils, prostate, etc.

Symptoms.—The symptoms of colonic irritability are among the most common encountered in clinical gastroenterology. To begin with, patients suffering from this disorder are frequently aware of their intestinal activities. They have been aptly described as being almost constantly "belly-conscious." Abdominal distress and restlessness, flatulence and distention, gas pains and minor colics, tenesmus, fits of diarrhea with or without preceding constipation, are all familiar manifestations of this condition.

Varieties.—Naturally, there are all degrees and many varieties of colonic irritability. Perhaps the mildest form is that encountered in hypersthenic individuals. Here, a heightened colonic tone is so much the rule that it may be regarded as a condition of normality. Thus, such an individual, even in perfect health, may pass two or three semi-formed or even mushy stools daily; usually one after each meal. As time goes on, these patients seem particularly

likely to develop diverticulosis, a condition which is oft-times closely associated with increasing constipation of the spastic variety. It is in these cases, too, that the opaque enema frequently reveals the condition that has been described as "fibrillation." Infection of the diverticula (diverticulitis) may also occur, though this happens relatively seldom in proportion to the total number of cases revealed by Roentgen studies.

Another special and common form of irritable colon is often called mucous colitis (colica mucosa, myxoneurosis coli). This disease is usually associated with a high degree of autonomic instability. In this disorder, mucus is produced in excess; and when inspissation occurs, shreds or casts are expelled, often with painful colics. Patients sometimes mistake these casts for tapeworms. Occasionally, the presence of mucus in the stool is not noticed by the patient; and this symptom can only be elicited by careful questioning on the part of the physician. It is well to remember that mucous colitis is almost always associated with constipation, or at least with incomplete bowel evacuation.

Diagnosis.—On physical examination, the patient usually shows tenderness over the various parts of the colon, and very often over the entire abdomen. Localized tenderness in the right iliac fossa or right hypochondrium is not uncommon, and is very misleading. The diagnosis of "chronic appendicitis" is very often made in simple colitis.

Proctosigmoidoscopic examination is always useful. In the majority of cases, especially when the distal colon is involved, the direct inspection of the mucosa of the rectum and sigmoid clinches the diagnosis. Usually free mucus is seen lying in the gut. The appearance of the mucous membrane depends on the stage of the disease, and on the segment of the colon involved in the pathologic process. The changes are most marked when the distal colon is primarily affected. In early and mild (functional) cases, we find merely congestion of the mucosa. In the more severe and advanced (organic) cases which we are not now

considering, the lesions range from small punctate petechiae and ulcerations to atrophy of the mucous membrane with large or small ulcers, or to the well-known polypoid appearance. Occasionally, spasm is so marked that the introduction and passage of the instrument becomes quite difficult, the patient complaining of an undue amount of pain.

Test meal.—Examination of the gastric contents may prove to be helpful, inasmuch as an achylia or marked hypochlorhydria, when present, is generally related to the associated colitis.

Feces.—The stool examination is of utmost importance. The elaborate laboratory procedures described in the literature, although of value in the hands of specialists, may serve to discourage the more general recourse to this valuable aid in diagnosis. In the overwhelming majority of cases, a mere glance at the stool is sufficient for all practical purposes; yet it is just this simple inspection that is so often neglected. Given a stool which is mushy in appearance, contains an excess of mucus, gives evidence of fermentation by the presence of numerous small gas bubbles on the bottom and sides of the jar, is strongly acid in reaction, has a penetrating sour odor, and the rest of the examination is either superfluous or merely confirmatory. Almost always, gross mucus is present.

The form and consistency of the stool also varies with the part of the colon involved in the pathologic process. The feces may be formed or semi-solid, though in the majority of cases, there is an increase in the water content of the stool. The color depends ordinarily on the food ingested.

The microscopic findings vary in the different types of colitis. There is always an excess of mucus. With deficient gastric or pancreatic digestion, there is always an abundance of meat fibers with or without striations. In fermentative dyspepsia, we often find incompletely digested starch granules or fungi which stain black with

iodin. For more detailed methods of examination, reference may be had to books and articles on this subject. It should be added, however, that the patient should always be placed on a standard intestinal diet (Schmidt) for at least three days preceding the examination of a stool, whenever the findings are at all doubtful.

Roentgen diagnosis.—This is perhaps the most useful single method for the diagnosis of colitis. It will be recalled that the filling and emptying of the colon take place according to a definite time table. Normally, the cecum begins to fill four hours after the standard opaque meal. At six hours, the head of the barium column reaches the region of the hepatic flexure; the tail is still in the ileum. At nine hours, the head reaches the splenic flexure, and the tail has cleared the terminal small intestine. At twenty-four hours, the bowels have moved once; and the left-sided shift has occurred—that is, the barium has cleared the proximal colon in whole or in part, and has become distributed throughout the distal colon. By forty-eight hours, the bowels have moved twice, and the colon is clear except for traces of the barium.

Any departure from the above schedule is abnormal. If the change is in the direction of stasis, a diagnosis of some variety of constipation is in order. When, on the other hand, the colonic transit is hastened, if only in part, there exists a state of irritability which is the essential motor expression of colitis. Colitis may, therefore, be diagnosed, or at least suspected, from the following Roentgen findings:

1. At the "six hour observation," the head of the column is beyond the splenic flexure.

2. At the "nine hour observation," the head of the column is in the pelvic colon or rectum, with or without the passage of a stool containing barium. (Figs 7 and 8.)

3. At the "twenty-four hour observation," the colon is empty.



FIGURE 7

In addition to the abnormalities of function, there are interesting changes in colonic form as revealed by a consideration of the sacculi or haustrations. Normally, these are deep-cutting, evenly spaced, and evenly balanced—that is, the lumen is central, and the haustra on either side are equal in size, and symmetrical. In colitis, there is either irregularity or complete absence of the haustrations, lending an atypical beaded, mottled, or smooth appearance to the fecal column, as the case may be.

Similarly suggestive is a scattered filling of the colon, or actual filling defect, provided, of course, that obstruc-

diet, which may be concentrated in regard to the number of feedings to three in the twenty-four hours. All cold foods and drinks are to be avoided. If the above regime should prove too constipating, the best results will be obtained from mineral oil, agar, or psyllium seeds.

As the condition improves, other articles may be added, one by one, to the diet. The stools are to be carefully watched during this process, and if they again become mushy, one must return to the feeding which last gave a normal fecal output, and try some other addition than that which proved harmful. Among the first articles to be added to the basic regime are well-cooked breast of chicken, rice, fish, and finely pureed starchy vegetables. Fermented milks or acidophilus milk are well borne by some patients. The last items to be added—and with the greatest caution—are the raw vegetables and fruits, and, in general, foods containing mechanical or chemical irritants. Indeed such articles may never be tolerated by many individuals.

Medicinal Treatment.—When the stools do not readily resume their normal form and consistency, the administration of an ounce or two of castor oil, repeated weekly if needed, helps to clear out old residues, mucus, and bacteria. In other cases, sodium phosphate or similar salts give better results, since some patients cannot stand even the mild irritating action of the ricinoleic acid. It is important that the salines be given in slightly hypertonic concentration and on an empty stomach, for, when the salts are exhibited in too concentrated form, the excessive osmosis which takes place into the gastro-intestinal lumen may actually cause cramps or even delayed action of the bowels.

The inert bulky chemicals already mentioned are of value in allaying colonic irritability. They not only supply the necessary "roughage," but aid further in mechanically removing mucus and bacteria by "adsorption." The ordinary barium sulfate used for Roentgen diagnosis is admirable for this purpose; so is the bulky diatomaceous earth

known as kaolin. When both drugs are mixed in equal proportions, a thorough suspension is assured. The dose, which is a tablespoonful of each powder twice daily, is best administered in cocoa, fermilac, cereal, applesauce, or some similar thick mixture. This form of therapy should be pushed for long periods, and only gradually discontinued.

Other drugs may be used as occasion demands. The general sedatives (chloral and bromids together in small doses) are always useful to depress autonomic instability. If there is much pain, codein may be ordered, though this is seldom necessary. For overcoming spasm, atropin or belladonna in increasing doses is very helpful, and is probably the best drug for routine use. One may begin with as much as ten or fifteen drops of the tincture three times a day, and raise the dose one drop daily till the symptoms disappear, or the ocular accommodation is paralyzed. When gastric anacidity exists, dilute hydrochloric acid is indicated, the dose being five to twenty drops in a glassful of water to be taken with meals. Conversely, if there is hyperacidity, a neutral antacid such as tribasic magnesium phosphate may be employed when constipation predominates, or the calcium salt when the bowels are loose. The dose of each is one teaspoonful or more, thrice daily.

In many cases, heliotherapy or the artificial actinotherapy seems helpful. The latter is supplied by gradually increasing exposure to the ultraviolet rays. Other patients respond favorably to the application of the abdominal compress. Very probably diathermy is of value in some cases.

DIVERTICULOSIS AND DIVERTICULITIS

Most cases of diverticulosis are discovered at X-ray examination or at autopsy, and cause no symptoms. Trouble only arises when the contents of the sacs become so inspissated as to cause perforation, or when the sacculi themselves become infected. Both these complications lead to perisigmoiditis in its acute or chronic varieties. The prophylaxis of diverticulitis consists in the treatment of

the underlying spastic constipation, with special attention to adequate lubrication. Mild cases are treated the same as simple colitis, with even more emphasis on the use of barium or barium and kaolin mixture in large doses. These powders fill the saccules with inert matter, thus replacing the harmful putrefactive or infected contents. In recurrent cases, the barium treatment must be continued indefinitely.

In the presence of infection and even of small perforations, a conservative, expectant therapy is justifiable, inasmuch as the escape of distal colon contents is less dangerous to the peritoneum than is that of the more fluid and virulent material present in the large intestine. In the face of these complications, complete bed rest, the application of an ice bag or coil, and the administration of sedatives is often effective. Should, however, the clinical symptoms point to progressive peritoneal involvement or to actual abscess formation, prompt operative relief is, of course, indicated. In all doubtful or borderline cases, a surgeon should be called early in consultation.

Mucous Colitis.—The treatment of mucous colitis involves:

1. Control of the underlying constipation.
2. Control of mucus accumulation.
3. Control of the colic.
4. Improvement of the nervous and general health.

1. The underlying constipation is to be controlled by the measures already outlined. If spasticity is marked, or if the colon is very sensitive to irritants, it is well to avoid the use of rough foods. Indeed, these may be more harmful under such circumstances than mild tonic laxatives, such as cascara, agar or phenolphthalein agar. Otherwise, the general rule is that the diet should be built up as quickly as possible, so that colonic tolerance to the ordinary food irritants should be increased rather than

diminished. In general, the oils are well borne in mucous colitis, both when given by mouth and by rectum. Overnight instillations of warm olive oil, cotton seed or corn oil are particularly beneficial, not only for the constipation, but for the removal of the mucus as well.

2. To overcome the accumulations of mucus, a weekly purge of castor oil or of calomel is recommended. Colon irrigations are occasionally of benefit. At first, the irrigations may be given daily or every other day for one or two weeks; then twice a week for several more weeks; and, finally, once a week until the mucus is eliminated. Before the irrigation proper, a cleansing enema should be given to remove whatever fecal accumulation may be present. Plain hot water, saline solution, or lime water in amounts ranging from twelve to twenty-four quarts may be employed for the irrigation. When spasticity is prominent, local intraintestinal applications of magnesium sulfate are very well worth trying. Transduodenal lavage with a hypertonic saline solution, as recommended by Jutte, may give relief in some cases.

3. The treatment of the attacks of colic necessitates active sedative and relaxing measures. Rest in bed; bromid by mouth; atropin and codein by hypodermic injection; all in full physiologic doses, together with hot applications to the abdomen in the form of hot water bag, electric pad, poultice or stupe, or even a hot bath, are among the most useful measures. In addition, the mucus accumulation must be removed, whether by castor oil by mouth, or by colonic irrigations, or by the administration of oil enemata.

For measures directed toward the improvement of the nervous and general health, the reader is referred elsewhere. Inasmuch as increased fatiguability is a characteristic of patients suffering from mucous colitis, it is essential that they should get plenty of rest and sleep, and that they should avoid strains and excitement of all sorts, mental, physical, and emotional.

class availed themselves of the privilege of visiting the wards of the hospital from time to time.

In 1820 the New York Eye Infirmary, later the New York Eye and Ear Infirmary, was founded. In the annual report for the year 1822, it is stated that "the number of pupils who have attended the practice and operations of the Surgeons of the Infirmary has been increased to 28." This shows that teaching in diseases of the eye had been instituted almost simultaneously with the founding of the Infirmary. This instruction as in the case of the New York Hospital was given both to undergraduates and graduates in medicine, the great majority being medical students. A still more elaborate plan for instruction in diseases of the eye was begun at the New York Ophthalmic Hospital soon after its organization. The first annual report of the surgeons of that hospital for the year 1853 states that "Quite a number of practitioners from the city and county have also (in addition to medical students) visited the hospital from time to time for the purpose of witnessing treatment and methods of operation. In addition it will be seen in another part of the report that one of the surgeons has given a course of lectures on the anatomy, physiology and diseases of the eye to a large and highly respectable class of medical students and professional gentlemen during the present winter. It is the design of the surgeons to render it not only a hospital for the afflicted and destitute but an ophthalmic school to which students of medicine will resort in preference to other cities for the purpose of finishing their medical education."

The second annual report, 1854, gives "a catalogue of students and graduates in medicine amounting to sixty-five in all who are attending a course of lectures on ophthalmic surgery." In 1855 fifty to sixty students were in attendance. A testimonial was given to those who passed a satisfactory examination. The catalogue of 1858-59 claims that the school is the only one of its kind in America. In 1864 over five hundred students of medicine had availed themselves of the privileges of the hospital. As

in the case of the New York Infirmary the majority of those attending the school were undergraduates. A change of policy took place on or about the year 1877 for the report of that year stipulated that students in the school must have already the degree of doctor of medicine. On May 20, 1879 the State of New York authorized the College to confer the degree of *Oculi et auris chirurgus*. Some two hundred and fifty have received this degree which is at present conferred upon candidates who must be "doctors of medicine" and "who have attended at least 80 per cent of the scheduled work of the full course and on examination have attained a mark of 75 per cent in each subject scheduled."

No public courses were given so far as can be ascertained solely to graduates in medicine during the first 70 years of the century.

In 1871 Dr. L. Duncan Bulkley returned from post-graduate study in Vienna. There he had been so impressed with the method of the teaching of Hebra in whose clinic he had worked that he put it in operation for the benefit of physicians and students in the skin clinic at Bellevue Hospital of which he was temporarily in charge. He continued to do this for several years until he was appointed in charge of the Skin Clinic at the DeMilt Dispensary. (2)

At about the same time that Dr. Bulkley returned from Vienna, another young physician by the name of Clinton Wagner returned home after studying under Sir Morell Mackenzie at the London Throat Hospital in Golden Square. He was so much impressed with the character of the work done at this famous hospital that as soon as he was able to, he organized, in 1873, in New York an institution patterned after the London institution which he called the Metropolitan Throat Hospital. This was the first hospital in America to establish upon a regular basis the instruction of graduate physicians in the science of Rhino-Laryngology. "For many years it maintained a degree of excellence which constituted it easily the best. The reputation of Dr. Wagner and his admirable hospital soon

became known outside of New York, not only among those requiring the aid of the highest order of professional skill but also to advanced students and practitioners, who striving to improve their knowledge of the special art, sought the best and most inspiring instruction. His disciples came from all directions, not only in the United States but from Canada, and the Spanish American countries. Many of them attained eminence, such as John H. Lowman, of Cleveland, and Carlos Desvernine of Cuba.

In 1881, Dr. Wagner was among the first to enter upon the organization of the New York Post-Graduate Medical School and Hospital and was its first Professor in Laryngology and Rhinology. He retained that position until 1886 when he retired from practice. Meanwhile he had thoroughly established the prestige of the Metropolitan Throat Hospital and Dispensary, and had made it a model institution which rivalled the best clinics of its kind abroad."

(3)

At the DeMilt Dispensary Bulkley met a number of men who were interested like himself in this method of teaching and who desired to make the DeMilt Dispensary a center for post-graduate work. As a result of their efforts, they organized themselves into a teaching staff. They printed schedules of the courses they gave which were published and appeared in the *New York Medical Journal*. These courses were in full operation during the years 1877 to 1879. Those who constituted the teaching body were G. M. Lefferts, H. T. Hanks, L. Duncan Bulkley, P. Brynberg Porter, Robert Campbell, Daniel Lewis, Lawrence Johnson, W. E. Bullard, N. B. Emerson, A. A. Smith, C. E. Billington, John S. Warren and Thomas E. Satterthwaite. Bulkley had already begun his teaching at the Dispensary in 1876 and according to Satterthwaite (4) inaugurated the movement. It is interesting to note that this pioneer in post-graduate teaching is still alive at the advanced age of eighty-two. He had printed circulars issued for the course which he gave, which lasted six weeks and for which he made a small charge. When the work was fully organized he gave free lectures in the DeMilt which were very

popular. Later he transferred the lectures to the New York Hospital and in 1898 began to give weekly clinics in the out-patient department of the New York Skin and Cancer Hospital. These lectures were largely attended and drew men from all over the country. They were continued until the beginning of the World War. (2)

In the later 70's and the early 80's Dr. D. Bryson Delavan was another one of those in the group who gave instruction at the DeMilt Dispensary. He advertised and gave private lessons in Laryngology charging \$3.00 per lesson.

All the courses at the DeMilt were open both to graduates and undergraduates in medicine. To Bulkley's lectures at the New York Hospital and at the New York Skin and Cancer Hospital physicians only were admitted.

It is a common observation that great discoveries have been wont to find their conception in the minds of two or more men at the same time. So true is this of graduate education in New York that it is difficult or impossible at the present time to say to whom is due the credit of being the first to conceive it and put it in operation. Among those who returned from Europe impressed with the need of providing opportunities for graduate instruction in this country were graduates of the College of Physicians and Surgeons, among them Dr. Thomas Satterthwaite and Dr. Albert H. Buck. They conceived the idea of establishing a center for such work in connection with the College of Physicians and Surgeons and to this end were instrumental in incorporating the Alumni Association of the College of Physicians and Surgeons in 1873, with the hope that "the under graduate Faculty would favor the establishment of an extra mural corps of teachers for physicians only," as practiced in the Scotch Universities. The plan however did not go thru on account of the opposition of the Faculty. Disappointed in this direction, they proceeded to organize the teaching staff at the DeMilt Dispensary just referred to. Abandoning the plan of a center exclusively at the College of Physicians and Surgeons they

turned to the idea of making New York a great post-graduate center, the teachers coming from the three medical schools, New York University, Bellevue and College of Physicians and Surgeons. A committee was formed consisting of Dr. Thomas T. Sabine representing the College of Physicians and Surgeons, Dr. Alfred L. Loomis New York University, and Dr. William T. Lusk Bellevue, and an organization was effected which was called the New York Polyclinic. They held meetings from time to time but all efforts toward founding a post-graduate institution were without success. (4) At about the same time that this group of men was endeavoring to establish a graduate medical center in New York, another group was equally impressed with the fact that graduates in medicine who desired to pursue further special study had no opportunities in New York City other than those afforded by the hospitals and by undergraduate schools. They succeeded in impressing the desirability of meeting this want upon the Faculty of the New York University Medical College and in 1875 a post-graduate department was established there. (5) The Faculty of this Department consisted of seven professors who were permitted to grant certificates to graduates who attended and otherwise qualified. This Faculty was known as the Supplemental or Post-Graduate Medical Faculty. The names of the seven professors who constituted the Faculty were W. A. Hammond, James L. Little, D. B. StJohn Roosa, Fred R. Sturgis, M. R. Patten, J. W. S. Gouley and Henry G. Piffard. These courses were continued for seven years or until 1882. The conditions however under which the instruction was given were to them not at all satisfactory and in 1881 they demanded that they be allowed to hire a separate building, paying the rental from the fees of the students and that the instruction which was given to both undergraduate and post-graduate students should be exclusively for graduates in medicine. The University Faculty was not prepared to grant their demands and so on the 4th of April 1882 they resigned. (6-7) In Roosa's words: "Like Abraham we did not know the country to which we were going but the Lord

had ordered it and we went." "The most active leaders in this secession were the former Surgeon General of the Army, W. A. Hammond, D. B. StJohn Roosa, Frederick R. Sturgis, Montross A. Pallen and Henry G. Piffard." At first they endeavored to effect an affiliation with some University and actually made overtures to Princeton and Cornell with a view to establishing an undergraduate medical college where a course of post-graduate instruction would be given. This proved unsuccessful. As a result it was determined to establish in the city a school solely for post-graduate instruction. The scheme was actually the plan that those had in mind who had effected the paper organization known as the New York Polyclinic. On account of this name being already in use, the name New York Post-Graduate Medical School was adopted. The date of its birth according to the *Post Graduate* is April 4th, 1882, the date that the separation took place from the New York University. Frequent meetings were held, twenty-four in all during the summer and fall of that year and on June 27th at the residence of General Hammond a committee or organization was effected with Dr. Hammond as Chairman and Dr. Satterthwaite as Secretary. Dr. Sturgis, shortly afterward to be secretary of the Faculty, was the third member of this committee present.

This committee directed the policy of the new school for the first year. The *New York Medical Journal* of August 19th and 26th, 1882, contained announcements of the opening of the school which took place on the 6th of November 1882. The teaching faculty consisted of: James L. Little, W. A. Hammond, D. B. StJohn Roosa, Clinton Wagner, Henry G. Piffard, Frederick R. Sturgis, Montrose A. Pallen, Thomas E. Satterthwaite, Mary Putnam Jacobi, Edward C. Spitzka, William G. Morton, Herbert G. Lyttle, William H. Porter, Edward T. Ely, Whitfield Ward, W. T. Alexander, Henry Hughes, M. Josiah Roberts, Seneca D. Powell, Graeme M. Hammond, John N. Nesbit, C. A. Van Ramdohr, G. Fairfax Whiting, S. S. Burt and J. Hilgard Tyndale. Two days before the school was opened to students a formal opening took place at Chickering Hall.

(4) Difficulty was encountered in securing an incorporation of the young school on account of the opposition of the Attorney General of the State to granting a charter on the ground that the phrase "other institutions of learning" did not comprehend a post-graduate medical school, since none existed when the law was passed. Finally, however, a special law was enacted by the State Legislature to incorporate the School. The first course of instruction was given at the College of Pharmacy in East Twenty-third Street, November 6, 1882. There were six physicians in attendance and one hundred students matriculated during that year, 1882-83. Rice, at one time secretary of the Faculty states that: "The first annual announcement contained the names of nine professors, eight associate professors, and eight instructors. The school at first had no hospital of its own, and the teachers were compelled to supply their clinics with such patients as were able to walk to the building but the Faculty adhered to the fundamental principle upon which the school was organized, that all teaching should be actual demonstration of patients, and that didactic lecturing should have no part in its methods of instruction. From there it moved to a tenement house and in 1885 took an Old Ladies' Home, in Twentieth Street."

The school grew so rapidly that at the beginning of the fourth season still more commodious quarters were necessary which were secured at 226 East 20th Street. Two years after the opening of the school, the hospital department was opened with at first only a ward for surgical diseases of women. Gradually the capacity of the hospital was increased until all the building above the second floor was filled with patients.

Dr. D. B. StJohn Roosa, the President, was one of the outstanding figures in medicine in America during the latter half of the 19th century. He was born in Bethel, New York, September 4th, 1838 and was educated at Yale College and in medicine at the Medical Department of the New York University graduating from there in 1860.

He served as house Surgeon, New York Hospital, 1861-62. For two years he was assistant surgeon in the United States Army during the Civil War and later did post-graduate work in Vienna for a year. He early became distinguished as a specialist in Ophthalmology and Otology becoming the Professor of Diseases of the Eye and Ear, in the Medical Department of the New York University in 1875 and was the author of two well known text books on diseases of the eye and ear. He early took a deep interest in post-graduate medical education in America and his chief fame rests upon his long connection with it as president of the New York Graduate Medical School and Hospital. Dr. Roosa died March 8th, 1908.

Dr. James L. Little, one of the founders who died April 4th, 1886 conducted the first clinic at the Post Graduate School after its organization. The school continued to grow. It attracted to it the best teachers in the city and students from all over the country. In 1894 the original part of the present building was opened and in 1910 as a result of a gift of \$2,000,000 from Fred Cooper Hewitt of Oswego, New York, the present addition was opened.

In the year 1909, six hundred and seventy-three (673) doctors were in attendance at the school. During the forty-four years of its existence twenty-five thousand three hundred seventy-three (25,373) physicians have received instruction at the school.

At the same time that most of the men whom we have spoken of were studying abroad or had just returned from Europe, there graduated (March 1869) from the medical department of the University of Louisville, one of the leading medical schools of the south, a man to whom equal credit should be given for the development of post-graduate instruction in this country, Dr. John Allen Wyeth. At that time "the teaching of surgery, medicine, obstetrics in the medical schools in the south was almost wholly didactic." There was no opportunity for hospital observation such as existed in New York at the New York Hospital. After his graduation Wyeth began the practice of

medicine in his native town in Alabama. In his own words "the experiment lasted six weeks. He had five patients and with each successive victim, he became more and more convinced of the truth of the maxim that a little learning is a dangerous thing. He had to quit, feeling that he did not know enough to justify him in placing himself in a position where the life, the health and happiness of human beings were in his hands. He needed to learn the practical application of the theory taught him at college. He determined to secure a post-graduate medical training." "He came to New York and graduated in medicine at Bellevue Medical College in 1873. He later was appointed assistant demonstrator of anatomy. He remained at Bellevue until 1877 in the capacity of prosector to the Chair of Anatomy and Assistant to the Professor of Pathology." His conviction that practical instruction was necessary in order to acquire a proper medical education led him to endeavor to establish an undergraduate medical school in the city where clinical instruction would be a prominent feature. This he was unable to bring about and finally abandoned the undergraduate feature of the plan and in 1881-82 (there is a dispute in regard to the year) the Polyclinic was organized. (9) According to Satterthwaite, "The New York Polyclinic, as it was called in 1882, was actually a continuation, certainly so far as the name is concerned, of the New York Polyclinic that had for years been a skeleton organization, of which Dr. W. T. Lusk and Dr. F. A. Castle, with the writer, had been members. But at its origin as the Polyclinic of 1882, these names were absent. I am able to say that Dr. Virgil P. Gibney told me (on October 22, 1907) that in the spring of 1882 he received from me the scheme of the original Polyclinic. It formed the basis of the Polyclinic of that year." (4)

The school was opened in November, 1882. The first session was held in the ground floor of 213-16 East 34th Street. The original faculty of the Polyclinic was a brilliant one—it comprised Drs. James R. Leaming, John H. Ripley, E. Darwin Hudson, Louis Elsberg, Landon Carter Gray, Richard C. Brandies, A. R. Robinsons, Edward B.

Bronson, George R. Fowler, John A. Wyeth, A. C. Gerster, Paul F. Munde, W. Gill Wylie, Emil Gruening, David Webster, V. P. Gibney, and Charles F. Stillman.

Eighteen students were in attendance at the opening session with one hundred eighty-two registered during the year. The school under the leadership of Wyeth at once demonstrated the need of its existence and has attracted hundreds of medical men. In 1910 it erected the twelve story hospital at 335-355 West 50th Street which it occupies at present. In 1922 Dr. Wyeth died. Apart from the honor that is due him of being one of the founders of graduate education in America, he is distinguished as being of the leading surgeons of New York of his time.

The Polyclinic now has a staff of two hundred seventy-five physicians and surgeons. During the past year it has taught one hundred ninety-nine graduate student physicians and its census for the current year will greatly exceed that number.

The Post-Graduate and Polyclinic Medical Schools and Hospitals were of inestimable value in affording opportunities to acquire the most recent knowledge in the various fields of medicine and during the many years of their existence these opportunities have been taken advantage of by hosts of men from all over the country. They represent however only two hospitals in the great metropolis. More and more the idea impressed itself upon those who gave the matter thought that the rich opportunities for graduates in medicine afforded by the many hospitals in the city should be made known to the profession at large. This resulted in the organization on December 16, 1912 of the "Society for the Advancement of Clinical Study in New York" of which Dr. Charles N. Dowd was the Chairman. It first undertook to establish a Bureau of Clinical Information in the New York Academy of Medicine. A year later the society prepared and published a booklet of the fixed clinics of hospitals where visitors were welcome. At about that same time it began to publish a daily bulletin of surgical clinics. In 1917 it organized a

series of medical clinics which were given weekly and announced in a separate weekly bulletin. In 1922 the society undertook to gather information regarding post-graduate medical study in other cities. All the activities were carried on and gradually expanded until the society ended its existence in January 1924 merging with the Committee on Medical Education of the Academy. In 1919 a still more ambitious attempt was made to advance the cause of post-graduate medical education in New York in the organization of the New York Association for Medical Education. The principal objects of this association were set forth in its preliminary announcement as follows:

The proposal of a small group of physicians, surgeons and medical teachers of New York to establish a central clearing house for medical education has so favorably impressed their colleagues that what has been for years past a dream and a hope has now become an accomplished fact. The medical profession has developed within itself an active organization to stimulate, obtain support for, and expand medical education for students and graduates of medicine in the interest of an ultimate better service to the public. The scheme included a committee on education comprising the deans of the four undergraduate medical schools and representatives of the undergraduate institutions whose duty it was "to prepare plans and standards that shall insure a permanent improvement in the character of medical teaching in New York City; to keep itself informed concerning and to pass on the qualifications of teachers and the character of the courses they offer to graduate students of medicine, and to observe and regulate the manner in which engagements are met by those offering courses under the auspices of the Association." The Association stressed as the first and most urgent educational problem before it the development of medical education in New York City. The first president of the association was Dr. Wendell C. Phillips who was succeeded by Dr. Haven Emerson. Dr. Henry O. Reik was chosen for the first year of its existence as executive secretary. The association got out several bulletins setting forth in detail

the opportunities for graduate instruction in New York City. It maintained a bureau at the New York Academy of Medicine and thru its secretary furnished information to all inquiries as to courses and places of study. It continued actively in operation until in 1924 when it was merged with the Committee on Medical Education of the New York Academy of Medicine.

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Surgery"*

Evening meetings at the Academy. The evening meetings will begin promptly at 8.30. No tickets of admission will be required.

Tickets for afternoon clinics. Attendance at the afternoon hospital clinics which have been arranged for the Fortnight will be controlled by clinic tickets, for which advance registration is requested. Clinic tickets will be mailed to those who make reservations or may be called for at the Academy (Registration Bureau).

Additional clinics. Besides the specially arranged hospital programs, the regularly announced non-operative clinical conferences will be held as usual, *both mornings and afternoons* during the Fortnight, in over forty teaching hospitals of the city. No registration or tickets will be required for these clinics.

A complete program announcing clinics in hospitals, names of clinicians, and the program of evening meetings to be held at the Academy, will be mailed to the Fellows and may also be obtained on request.

LIBRARY NOTES

VISIONING OUR PERIODICALS

The simple little word vision calls forth the idea of wonderful possibilities. With the vision of the eye man sees all the beauties of nature spread out before him by a munificent Providence for his joy and happiness. But it is the vision of the mind which introduces the ideas from which progress and achievement result.

When therefore through several decades one has visualized a specific branch of human endeavor, as the desire to assist the profession of medicine in its efforts to arrest human suffering, one is amazed at the vision of the early builders of medical progress. Take for example our own favored Academy. For its beginning—a small number of doctors gathered together for the purpose of discussing means to further medical education and the providing of a medical library. In imagination one can see those worthy Founders planning what has proved to be our destiny—this useful working machine for forwarding medical progress throughout the intelligent management of its various committees. The library being specifically mentioned by the Founders, as of prime importance, has received the main portion of consideration since the Academy's beginning. In looking over the Trustees' minutes, one is impressed by the efforts continually made to collect funds for books and periodicals. "Aye, there's the rub," periodicals! Therein are to be found the notations of researches made all over the world, whereby students may verify some small point that has been searched for through all the leisure possible for years! How inexpressibly valuable the periodical and what havoc it makes with budgets. The late Nicholas Senn, after various futile attempts to see a reference, came to our library for a number of "Lyon Chirurgical." The attendant, knowing that we did not subscribe at that time for the journal, went to the stacks where were kept imperfect files. And there the only number of "Lyon Chirurgical" we had, was the one wanted! On

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5. Aufl., Berlin, Verfasser, 1929, 471 p.
- Jones, D. W. C. Elementary medicine in terms of physiology.
London, Lewis, 1929, 364 p.
- Jorge, R. Les faunes régionales des rongeurs et des puces dans leurs rapports avec la peste.
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- König, A. Physiologische Optik.
Leipzig, Akademische Verlagsgesellschaft, 1929, 241 p.
- Levy-Falco, P. R. Les auxiliaires sociales.
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- Livermore, G. R. & Schumann, E. A. Gonorrhea and kindred affections.
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- López Ureña, F. Afecciones del raquis.
Madrid, Morata, 1928, 173 p.
- Manson, (Sir) P. Manson's tropical diseases.
9. ed., London, Cassell, 1929, 921 p.
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- Muir, R. Text-book of pathology.
2. ed., London, Arnold, 1929, 872 p.
- Mulzer, P. Lehrbuch der Haut- und Geschlechtskrankheiten.
3. Aufl., Stuttgart, Enke, 1929, v. 1.
- de Napoli, F. La sifilide ereditaria dal punto di vista clinico sperimentale e sociale.
Milano, Soc. an. Istituto Scientifico, 1929, 409 p.
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- Novak, J. Die Menstruation und ihre Störungen.
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- Parkes, L. C. & Kenwood, H. R. Hygiene and public health.
8. ed., London, Lewis, 1929, 823 p.
- Porges, O. & Adlersberg, D. Die Behandlung der Zuckerkrankheit mit fettarmer Kost.
Berlin, Urban, 1929, 377 p.
- Powell, E. F. W. Water treatments, plain and medicated.
London, Daniel, [1929], 96 p.
- Quesada, S. Sifilis controlable.
Madrid, Morata, 1928, 270 p.
- Smith, F. J. London Hospital lectures on forensic medicine and toxicology.
3. ed., London, Lewis, 1929, 440 p.

- Spain. Ministerio de la gobernación. Dir. general de sanidad. Memoria de la campaña contra el paludismo (1925-1927).
Madrid, 1928, 528 p.
- Stapledon, W. O. A modern theory of ethics.
London, Methuen, [1929], 277 p.
- Stuart-Low, W. The care of the nose, throat, and ear.
2. ed., London, Baillière, 1929, 88 p.
- Thomson, J. G. & Robertson, A. Protozoology.
London, Baillière, 1929, 376 p.
- Valentine, C. W. The new psychology of the unconscious.
London, Christophers, [1928], 162 p.
- Wakeley, C. P. G. & Buxton, St. J. D. Surgical pathology.
Bristol, Wright, 1929, 904 p.
- Ward, E. Medical adventure; some experiences of a general practitioner.
London, Bale, 1929, 291 p.
- Winslow, C. E. A. The life of Hermann M. Biggs.
Phil., Lea, 1929, 432 p.

LIBRARY HOURS DURING THE SUMMER

From June 15 until September 15 inclusive, the Library will be open on week days from 9 a. m. to 5 p. m., on Wednesdays from 9 a. m. to 10:30 p. m., and on Sundays from 10 a. m. to 5 p. m.

OBITUARY

DR. REGINALD HALL SAYRE

The death of Doctor Sayre takes from the roll of active members a name first put there by the distinguished father on the organization of the Academy in 1847. Forty years later Reginald Sayre was admitted to the Fellowship and he too took a prominent part in the scientific and administrative work. For about half of the forty-two years of his membership he held office in the Academy. He was Assistant Secretary from 1892 to 1894, Recording Secretary 1895-97 and concurrently, a member of the important Committee on Admission, being the chairman in 1899.

Then in 1900 he was chosen Treasurer for the Trustees and served till December, 1905, when that office was abolished and he was elected Treasurer of the Academy and served eleven years more till 1917. So he was for sixteen years the financial officer—a tribute, certainly, to his judgment and probity. During this incumbency the first steps were taken looking to the broadening out of the field of activity of the Academy, the purchase of a site and the erection of a new building and Doctor Sayre was one of those very active workers who composed the Extension Fund Committee which raised the first \$140,000. In 1919 he was elected Vice-President to fill the vacancy caused by the death of Doctor Cragin. It might seem that he sought office, but he did not, he was just the willing horse, always ready.

His especial interest in the Academy was, of course, with what concerned orthopaedic surgery. He was often a contributor and in regular attendance at the section meetings.

In 1891-92 he rose to official distinction in the American Orthopaedic Association by his election to the Vice-Presidency and in 1893 he was an Honorary Vice-President of the Orthopedic Section of the Pan-American Medical Congress, and this year he was Vice-President of the New York Pathological Society also.

Reginald Hall Sayre derived from old American stock—from Thomas Sayre of Southampton, New York, 1640, and from John Hall of Charlestown, Massachusetts, 1630. His father, Lewis Albert Sayre, was born in New Jersey, his mother, Eliza Ann Hall, in Connecticut and he himself in New York City on October 18, 1859. He had two brothers, Charles Henry Hall-Sayre, (1850-1880) and Lewis Hall Sayre, (1851-1890) both of whom were graduated at the Bellevue Hospital Medical College, and one sister, Miss Mary Hall Sayre, who survives him. He attended the Churchill & Maury School in this city, entered Columbia College when he was eighteen and was graduated A.B. in 1881 with his mind fully made up to study law, there being already enough surgeons in the family and he actually did matriculate at the law school in Great Jones Street. Earnest talks with his brother Lewis however, finally induced him to turn to medicine, and there he certainly belonged. He entered Bellevue Hospital Medical College in the Fall of 1881. In the hospital examinations in 1884 he obtained the

choice of services. To the surprise of his fellows, because he was destined for orthopaedics, he chose the medical service—he was determined to start right at any rate. As interne he was junior to Hermann M. Biggs; the visiting staff of the Third Division was Austin Flint the senior, Edward G. Janeway, A. A. Smith and William T. Lusk. Sayre's desire was to get a broad, general training at Bellevue Hospital.

At this time Professor Lewis A. Sayre was a man of international repute with a very large private consultation practice, patients coming from far and near, having joint affections of every description, and his spacious office at 30th Street and Fifth Avenue was, in itself, it might be said, an institute of orthopaedic surgery. Reginald now joined his brother Lewis as junior assistant and his career spread out before him. Six years later his brother died. He assisted his father, also, in teaching at the college, attending the Bellevue Out-Patient Department, and that assiduously. He was like his father, a clinical rather than a didactic teacher; he succeeded him as Professor of Orthopaedic Surgery. Last May the Council of the New York University conferred on him the title of Emeritus Professor. He was a friend of the students and was one of the early supporters of the Medical Students' Club movement.

Sayre was one of the founders of The Society of Alumni of Bellevue Hospital and President in 1902-10. In his address to the Society he said: "A man should never overwork himself . . . as it is so easy to acquire a way of being slipshod and slovenly from lack of time. . . ." He did overwork himself. He was deliberate, not a fast worker and painstaking to an extreme in his attention to patients; apparently he thought himself a man with unlimited power of endurance. Perhaps this came about from his early training. At Columbia he entered into athletic and other activities with characteristic ardor. He received a scholarship in chemistry, he was a member of Phi Beta Kappa, a member of the class crew, a member of the 'Varsity track team and he held the championship in the Intercollegiate mile walk.

In fact he had many interests besides his profession. He was a lover of horses. He joined Troop A though he was not an accomplished rider, and remained with the Troop for years. He owned several fine horses and drove a very smart team in making professional rounds and on the road. One of his friends, himself an expert horseman, told the writer that "Sayre could manage any horse; he could put any horse into the shafts for he had a 'beautiful hand' and he was absolutely fearless."

He was renowned for his marksmanship. He was the champion All-America pistol shot and he captained four Olympic Pistol Teams in 1908, 1912, 1920 and 1924. A circumstance that occurred some fifteen years ago shows his conscientious thoroughness. He was Inspector of Small-Arm Practice, New York National Guard, and, thinking he ought to become adept with the broad-sword, he took this up and in a tournament reached the semi-finals, but an attack of influenza intervened and he surrendered,

not to his doctor, but to the broad-sword which he could not lift though he had it in bed with him.

In 1917 he acted as Division Surgeon, N. G. N. Y. with rank of Lieut. Colonel; during the war he was in charge of orthopaedic instruction to medical officers at the New York University.

He was a public-spirited citizen, taking a deep interest in political questions and a Democrat up to 1896, but the "Cross of Gold" speech made him an independent voter. He was a member of the City Club. He formed his own opinions.

Doctor Sayre began rather early to write. Seven months after he completed his internship he read a paper at the Academy before the Orthopaedic Section on "The Immediate Restoration of Parts to the Normal Position after Tenotomy"* a very well-written and thought-out paper in which he boldly takes a position contrary to the opinions generally held at the time. Most of his writing was done when he was young; he wrote very little after 1910 and he wrote well. In talk he used many colloquialisms and, particularly with "run-about" children, he had rhymes and jingles at his tongue's end and he made good use of them; he could manage a fractious child as well as he could a fractious horse. Withal he possessed great mechanical skill, he loved his work and his practice was based on scientific knowledge for he kept well up-to-date; ethical conduct was natural to Sayre.

He started in life well on the road to success and by his own ability he reached and maintained a place of the highest worth in the minds and the hearts of his colleagues. Fraternal is a word that can well be applied to Reginald Sayre. He was a man of strong individuality, generous, large-hearted, unsparing of himself, devoted to his friends and he was held in deep affection by them. For much that he did his remuneration consisted in the satisfaction that comes from work well done and the gratitude and lasting regard of his patients.

Doctor Sayre was a Fellow of the American College of Surgeons, the American Medical and the American Orthopedic Associations (President of the latter in 1904). The hospitals where he did most of his work were Bellevue and St. Vincent's. He was Assistant Visiting Surgeon to Bellevue till a few months ago when he became Consulting Surgeon. He was Consulting Surgeon to St. Vincent's since 1910, Hackensack (1891), Hospital for Crippled Children, Newark (1897), Mountainside, Montclair (1898), N. Y. State Orthopedic, West Haverstraw (1900), Englewood (1901), Hospital for Deformities (1908) and Flushing (1914); also the West Side Hospital and Dispensary.

He belonged to the University and the Columbia University Clubs, the Society of the Early 80's (Columbia), Pilgrims of the United States, Coeur de Lion Commandery, Knights Templar, Jerusalem Chapter, Royal Arch Masons and Kane Lodge; the Army & Navy Club, U. S. Rifle Association,

* Alabama M. & S. Jour., July, 1886.

Manhattan Rifle and Pistol Association and the New York Athletic Club of which he was a Life Member.

The death of Doctor Reginald Sayre was entirely unexpected. It was due to myocardial degeneration and happened suddenly on May 29, 1919, in the course of a mild attack of facial erysipelas of two days duration.

ROBERT J. CARLISLE.

DEATHS OF FELLOWS OF THE ACADEMY

EDWARD HAMILTON SQUIBB, M.D., 184 Columbia Heights, Brooklyn, New York; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1881. Dr. Squibb was a Fellow of the American Medical Association and a member of the County and State Society. He was elected a Fellow of the Academy October 15, 1896; died, July 6, 1929.

WILLIAM HENRY LUCKETT, M.D., 18 West 87 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1894. Dr. Lockett was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons and a member of the County and State Society. He was Directing Surgeon to the Lutheran Hospital and Consulting Surgeon to the Harlem Hospital. Dr. Lockett was elected a Fellow of the Academy March 3, 1904; died, July 20, 1929.

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PUBLIC WELFARE IN VIENNA*

PROF. DR. JULIUS TANDLER

Commissioner of Health, Hospitals and Public Welfare, Vienna

The human catastrophe which by reason of the great War almost brought the people of Europe and particularly the people of Central Europe to extermination, has tremendously increased the value of human life whether measured in relation to the individual or in relation to the community.

War and famine made it indispensably necessary to adopt measures to conserve the population from a social-political point of view. It is, therefore, no cause for surprise that in a city like Vienna which suffered through the war as no other city, the responsible government authorities were compelled to take steps to repair the damages suffered by its population as rapidly as possible. This could be accomplished only by the erection of an entirely new and comprehensive instrument for social welfare service. According to my belief Vienna has accomplished this task in a satisfactory manner. If in many and various regions of the earth the Vienna social welfare service is spoken of with approving recognition it is surely an evidence of the efficiency and virtue of the system. To bring it into being there were necessary two things, a spirit directed to a definite end and the financial means. I would like to discuss the second item first.

The expense for maintenance of the social welfare service in Vienna is approximately 30 per cent of the expenses for maintenance of the entire city. We are spending so much

* Delivered before The New York Academy of Medicine, May 28, 1929

money for the reconstruction of the body of our population not because we are so rich—because Vienna is alas a poor city, but because of the very reason that we are poor. Naturally, everything that we are doing is done with the greatest economy. Although the annual expenses of upwards of 100,000,000 shillings for social welfare service are a very large item yet the expended capital undoubtedly returns its due interest yield.

Human conservation expenses can be said to be productive ones when their end is the reproduction and the reconstruction of human beings. All other expenses must be designated as unproductive; and the human conservation budget of a city can be said to balance only when the productive expenses exceed the unproductive ones.

May I here say a few words about my use of the phrase human conservation? I find no English equivalent for the German word "Bevoelkerungspolitisch" and am compelled to employ the locution human conservation. I will beg you to understand by that locution methods and means generally adopted for improving the population not only to obtain better human beings in the new generation but to improve bodily, physically and economically the present generation.

As long ago as 1924 the budget of the social welfare service was 60 per cent unproductive as compared to 40 per cent productive. The budget of the year 1929 shows the reverse relationship, namely, 40 per cent unproductive and 60 per cent productive expenses. This is surely evidence that the activity in that field has until now been crowned with success. But I would like at this very point to subjoin to this financial budget a few short observations concerning the organic budget. In the year 1911, a considerable time before the war, Vienna had an infant mortality of 17 per cent which rose during the war to from 30 per cent to 40 per cent. Since the year 1925 we have had in Vienna an infant mortality of 8 per cent; also an evidence that the financial means employed are organically

productive. In the very moment when the city government recognized that the management of its organic capital (that is to say, capital consisting of human beings) must be one of its greatest functions, it became clear that the method of private social welfare service, which was until then prevalent, must be retired and that in its place a rational social welfare service must be established. To extend help where there is absolute need cannot be left over to the kindly individual heart, but it must be made into the duty of human society; and thus the spirit in which the whole movement is managed is motivated by the principle that assistance must be regarded as an expression of duty. The poor or unfortunate has the right to receive assistance; the community as a form of organization of human society has the duty to assist. Of course even in Vienna we have not reached perfection in regard to this ethical law but we are on the way and it is the uniform execution of this law which has made the Vienna system so well known.

It was a necessary condition of a proper organization of the system that its execution should be concentrated in the hands of a single person to whom all methods of social welfare service were made available. This condition precedent was fulfilled in Vienna. Accordingly, there is at the head of the system a freely elected representative of the people to whom all social welfare service instrumentalities and offices are subject. It is as a result of this that the entire work has achieved its uniformity and efficiency.

It would lead me too far afield to attempt here an enumeration of all the possible instrumentalities for a social welfare system; I would like to cite a few examples only and particularly those which are derived from the productive social-political or eugenic economics.

A people if it is not to fall into decay must consider it its first task to equip the next generation as well as is at all possible. For that reason every system of human conservation must begin with infant and children's care. This

care cannot begin too early. Since legal regulation is impossible and if attempted would only lead to violations of the law, I have seized upon the means of the optional or professional marriage consultation and established in Vienna the first office of that kind. Of the fact that this office has prospered the best evidence is perhaps the circumstance that in the course of a few years, upwards of one hundred offices of the same kind were established in Germany based upon the model of the Vienna office. Of quite special significance is the pregnancy advice or consultation. We have in Vienna quite a number of such offices which have been working with excellent success. In connection with this system of advice in pregnancy, there was also waged a campaign against congenital syphilis. Every pregnant woman in Vienna who applies during the first three months of her pregnancy, receives without charge a Wassermann test. If she is free of syphilis and gives birth to her child, she receives for the child the sum of forty shillings as voluntary support. If she is syphilitic, she is treated without charge and receives the same sum after the birth of the child. This institution has justified itself quite extraordinarily not only because as a result our children's hospitals almost became free of children suffering from congenital syphilis, but also in that it leads to the treatment of the mother and ultimately the father against the disease. Since good nourishment and cleanliness are decisive in the upbuilding of the child, the city looks after both of these matters. Each mother who applies during the last two months of her pregnancy to one of the forty offices for advice to mothers, receives after the birth of her child a complete set of infant's equipment. In the last year we have distributed to mothers upwards of twelve thousand of such sets.

The notice of each birth in Vienna comes to the children's office which notifies the district social service worker. All of Vienna is divided into 200 districts for the care of children. In every one of these offices there is in charge a social service worker who is charged with the duty to visit the mother and child immediately after she

has received information of the birth. In all lying-in clinics established there is also present a social service worker of the community in order that it should be possible to get at these children immediately. The social service nurse goes to each new born child whether poor or rich. If the mother is rich, the visitor congratulates her upon the birth of her child and therewith her function is ended; but if the mother is poor, the social service immediately begins. If it is possible for the child to remain in the family, the mother receives whenever necessary a certain monthly contribution and every day during the first six months one litre of milk. The mother must, to be sure, call at least once every month with her child at the office for advice to mothers in her district and show the child to the physician in charge. This physician certifies whether the child has been well nourished and gives the necessary instruction so long as the child retains its good health. If the child is ill, then it is referred either to a hospital or to a physician. We take much pains to keep the children in the family circle as long as that is possible. When a child cannot longer be kept in the family, then the community must of course take that child over. The causes for taking over are manifold—poverty of the parents, illness of the mother, death of the parents, the moral hazards to the child because of environment, homelessness—all of these grounds must be considered. For purposes of taking over the children which are brought either by the parents or by the social service worker or by the police, a special office called the children's reception office is provided. The community has built a building of its own in which the children are quarantined for a period of twenty days. The number of receptions averages twenty per day, but sometimes rises as high as fifty. Within this institution, which is under the direction of a physician, the children are carefully examined both physically and mentally. The future destiny of the child is there decided. Some of the children are sent to foster parents which are examined monthly by the city. Some others are brought in to the city's own children's home, especially when there are

psychic defects which require closer study. Some are transferred to other children's homes in the city, some to institutions for the cure of tuberculosis if there is an indication for such treatment. Thus one observes that from one side there is a stream of children into the institution which emerges from the other side with some sort of care provided for them. The entire equipment of the building with its glass boxes has become typical and correspondingly famous.

For children between two and six years of age, there are provided upwards of one hundred kindergartens during the day. These kindergartens contain now upwards of eight thousand children. The mothers can leave their children at seven o'clock in the morning before they go to work and take them back when they return from work in the evening. The children are not merely reared there but are also fed.

Of special significance is the care taken of the school child. About fifty physicians visit the schools and examine the hygienic conditions there as well as the condition of the children. They are required to look after the children but not to treat them. Their decision governs whether the child should participate in the school feeding. About fifteen thousand children are fed daily a noon day meal in about eighty feeding offices. The decision of the school physicians also controls the manner of taking care of the child during the vacation. An organization established for that purpose under the control of the community brings every year about thirty-five thousand children to the country for a five weeks' vacation. The dental care which has been developed and obtained from America and England is also used in our own dental clinics. The school dental care is strictly rational. The children are examined twice a year to ascertain the condition of their teeth. They thereby learn the care of teeth. Defective teeth are either extracted or filled. The school dental care lasts as long as the school itself, namely from the sixth to the fourteenth year.

The constitutional variation and environment of the capitol city bring about a large number of backward children; so that it becomes necessary to make them the subject of special care. Those children which are so difficult to rear and whose mental and moral condition is most carefully examined with the aid of the most various methods are placed in special institutions established for their upbringing. The community in Vienna has such an institution accommodating about six hundred boys and another one accommodating about one hundred girls. In both of these institutions the children are maintained until they reach their eighteenth year and reared in accordance with modern pedagogical principles. Those who reach their fourteenth year receive a vocational education in vocational shops specially established for that purpose.

This description of children's care, although it certainly lays no claim to completeness, indicates in my opinion the uniformity of the system as well as the multifariousness of its execution. Over forty million shillings are spent in Vienna annually for this children's care exclusive of school and children's hospitals and institutions for the cure of tuberculosis. And if you will ask me whether this sum so expended is not too high in consideration of the poverty of our city, I can answer only that an intelligently governed city can spend for children's care only too little, never too much, for there is no capital investment which pays better for itself than children's care. The community in Vienna bought a castle formerly owned by the Hapsburgs and remodeled it as a children's home and not without reason did I cause to be inscribed on a marble tablet of this castle the words "He who builds palaces for children tears down the walls of prisons." The next healthy or at least healthier generations will return this expense with compound interest. That in connection with this service there are also maintained establishments for play and sports and bathing places is of course self understood. Our young ones are able to visit within the city twenty open air bathing places free of charge during all

periods of good weather and play there to their heart's content. Last summer about one million children made joyful use of this possibility.

Not only the office in charge of children's affairs, but also the board of health and the office for the care of the unemployed as well as the office for old people and incurables are subject to the department of general welfare. To discuss all of these departments would require a great deal more time than has been allotted to me. In discussing the children's care, I think I have discussed the most important and the most interesting department.

The place where this address is given, the Academy of Medicine, induces the thought that a few remarks might also be made about the relation between the physician and welfare service.

The industrialization and its consequences, the establishment of great cities and last but not least the recognition of the importance of prophylaxis have exerted their influence upon the situation of the physician. The physician cannot remain merely an individual therapist. He now stands as a part of human society in the very center of the social upbuilding of mankind. The state examining physician as hygienist represents the beginning of this movement. He constitutes the hygienic conscience of the state or the city. His task is much greater than the mere combating of sickness. He must segregate himself from the ranks of the individual therapists and devote himself to the task of being a social hygienist. In recognition of the importance of this I have ordered in Vienna that all newly engaged city physicians shall not be permitted to pursue a private practice. These physicians are paid a definite salary and receive no individual fees. Modern methods of production in great industries have brought it about that the employer and the employed have a common interest in the health of the worker. Out of this consideration and in order to protect the worker there arose the legislation of political social character and the

health insurance office. The health insurance physician receives from the office a fixed fee; he is still an individual therapist but he does not receive an individual fee. At the same time he also may pursue his private practice, a situation, however, which it will not be possible to maintain much longer. The conviction becomes more settled from day to day, that the health insurance physician must devote himself entirely to the health insurance patients unhindered by his private practice and in certain individual offices we see this system in the course of its growth. Thus in the establishment of the health insurance office for officials and workers by the city of Vienna I have urged that at least the three chief physicians who have charge of examinations should no longer pursue their private practice. A similar result is already manifesting itself in other offices. With the progress of an insured workers community the physician who is in private practice loses patients day by day. If one will consider that in Vienna from seventy to eighty per cent of all persons are covered by health insurance it will become evident that the large number of practicing physicians cannot derive a living from the remaining thirty per cent. To this must be added the constantly advancing specialization of medicine which requires the employment of instrumental assistance. Treatment of insurance patients is undertaken more and more in dispensaries because only there is it practicable to keep the necessary apparatus for examination and treatment.

To these two classes of physicians there should be added a third, the social service physicians. These are the physicians in connection with offices for advice to mothers, the school physicians, the physicians for the poor, the school dental physicians, etc. These physicians also receive a certain fixed fee and are permitted their private practice in addition. Some of them, however, have given up their private practice and live entirely from their fixed fees. Physicians have always expressed the opinion that the officialization—so to say—of their profession will be dangerous for their situation as well as for the patients. It was said

that by making the physician's position official it will become bureaucratic. That is certainly untrue. Bureaucracy is a constitutional anomaly and may be found in all professions. There are bureaucrats of medicine as well as bureaucrats amongst teachers and business men. The individual fee surely is not able to protect a man from bureaucracy. It has also been said that the patient seeks a physician in whom he has confidence. In what does this confidence consist and upon what is it based, since the patient knows neither what his illness consists of nor which physician is fittest to treat it? Frequently the source of the so-called confidence is the recommendation of a relative or an acquaintance who knows neither the sickness nor the physician. Thousands and tens of thousands of people go to hospitals and to dispensaries. Their confidence is purely anonymous for they don't know the physician who has their confidence. It is, therefore, not the question of confidence which has significance. It is true to be sure that many physicians will suffer a diminution of their income but equally certain is it that the majority is to gain if the physicians, just as the teachers and the judges, perform their high duties without receiving an individual fee. Those who are devoted to the calling of physician will as before become helpers of mankind, but those who desire to become rich will be compelled to choose a different kind of business. Human society is charged with the duty to provide for the health of all its members and at the same time with the duty to pay decently to its physicians out of the official coffers. Society and the physician must be the gainers and then medicine will not be a business nor a profession, but a free art, and the physicians will be artists for whom society itself will provide in a generous manner.

THE GENESIS OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY *

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The Medical establishment of the United States Army did not "spring full panoplied from the mind of Jove" or lesser creative body. Its advent was unheralded and unsung. It came not into being with any manifestations of pomp and splendor. Rather is it an establishment of slow growth, the result of struggles, hardships, vicissitudes, and development of years. It was officially christened one afternoon late in July, 1775. Its sponsors were men of grave and serious mien, members of the Continental Congress then holding its second session in the City of Philadelphia. Like all christenings, the natal day of this institution had occurred weeks if not years earlier for Congress only gave formal recognition on behalf of the United States, to an establishment already in existence in the colonies.

It is not quite clear when medical service with colonial troops began to be furnished by the colonies themselves at their own cost, but the records of Massachusetts show that in 1676 Mr. John Clark was appointed by that colony, chirurgion for a force of 500 troops then being raised and that a house was ordered built for lodging wounded soldiers. From that time on medical men in the colonies saw service both with colonial troops and with British Regulars in various campaigns conducted by Great Britain in the western hemisphere. The records of Connecticut show that there were military hospitals at Havannah and Crown Point, criticism being had because of the large quantities of supplies purchased for them in 1762. A military hospital, capable of accommodating 500 patients and provided with living quarters for the medical staff, was erected at Albany during the French and Indian War.

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During the years 1750-1774, a number of graduates of medical schools in Boston, New York and Philadelphia, being of limited means sought service with troops and in military hospitals for the experience not otherwise to be had. Other graduates having more ample means pursued post-graduate courses in the medical schools and hospitals of England and Europe. Some of them, also, saw service with the armies of continental Europe. While these men were perfecting their professional attainments they were acquiring military training and a knowledge of the management and administration of army hospitals which stood them in such good stead when military responsibilities were thrust upon them in 1775. A few of them including the illustrious Joseph Warren, who died in the battle of Bunker Hill, while a Major-General of the Massachusetts forces, chose the duties of command rather than the service of their profession and attained to high rank. Medical men in those days were more active in affairs, social and political, than to-day. Nine of them participated in the battles of Concord and Lexington April 19, 1775. Twenty-five were members of the Provincial Congress of Massachusetts. Thirty-one, including General Warren, participated in the battle of Bunker Hill, June, 1775. A small number were members of the Continental Congress, particularly during the earlier years of the War.

For a number of years prior to 1775 increasing interest had been taken by the colonies in their militia. Regiments, battalions, and companies were organized, equipped and drilled in conformity with militia regulations promulgated by the Crown in 1764. While the number of men per company and the number of companies per regiment varied in the different colonies, the regimental staff was practically the same in all of them. The medical staff of the regiment was one surgeon and one assistant called mate. In some colonies two mates were allowed. In time of peace this medical staff apparently did not participate in any of the drills or training. Probably they were not selected or assigned until the organization was ordered

to mobilize. It was customary for the colonel of the regiment to select the surgeon and the surgeon to select the mate, in order that their acceptability to the organization might be assured. No provision for a central medical organization or directors appears to have been made by any colony.

The seizure on September 1, 1774, by a force of British troops acting under the orders of General Gage, of a quantity of ammunition belonging to the colony of Massachusetts stored at the town of Medford alarmed all the colonies. Committees of Safety were appointed for the defence measures. These committees again appointed sub-committees to provide arms and supplies of all kinds and to supervise the organizing and training of the militia. Patriotism and enthusiasm ran high. Additional regiments were organized and equipped. Measures were taken to provide the colonies with needed medicines and surgical instruments. Chests of medicine and sets of instruments were purchased for each regiment in so far as they could be obtained. They were given into the custody of the regimental surgeon who was held responsible for their safe-keeping and economical use. Massachusetts authorized 15 medicine chests and appropriated 500 pounds for the purchase of such articles therefor, as could not be had on credit. Connecticut authorized "one medicine chest and apparatus, not to exceed forty pounds, for each regiment, and a capital set of instruments for each Corps on any station." New York authorized the purchase of medicine chests, surgical instruments and other utensils and requested two medical men to supervise their purchase and inspection. Probably other colonies did likewise. Some of the Southern colonies were able, later, to capture from British forces medicine chests and instruments they could not procure otherwise.

Early in 1775 the provincial legislature of Massachusetts had become restless and watchful. It should be remembered that General Gage had shut himself up with

a large force of British troops in Boston in the autumn of 1774. On the night of April 18, 1775, he dispatched a force to seize a store of ammunition reported to be at Concord. The movement known, the inhabitants of Concord and Lexington notified, a conflict occurred on the following day at both places between the British forces and the provincial minute men. The first blood was shed of a conflict destined to last more than seven years, and to result in the independence of the colonies. The provincial wounded were cared for primarily by the medical men present and later in hospitals in Cambridge. This action on the part of General Gage was taken as an affront not only by Massachusetts but also by the adjacent colonies that could only be assuaged by armed conflict. Militia organizations were filled up as rapidly as could be and regiment after regiment began to assemble at Cambridge and adjacent towns not only from Massachusetts but from Connecticut, New Hampshire and Rhode Island.

This assembling of troops called for medical service which the colonies were prompt to provide and in this Massachusetts, being the most involved, took the lead. A board of medical examiners consisting at first of three members, later increased to seven, and three authorized to constitute a quorum, was appointed May 8, 1775, for the examination of all candidates for appointment as surgeon or mate in the colony forces. Regimental commanders were directed to submit to this board the names of the men selected by them as surgeons. Examinations were held. These examinations were searching and thorough. The names of successful candidates were submitted to the Provincial Congress and commissioned. The unsuccessful candidates were privately advised of their rejection. A general hospital was, by resolve of April 29, 1775, established at Cambridge under the direction of Dr. Isaac Foster, for the care of the sick of the regiments encamped there and of the wounded remaining from the battle of Concord and Lexington. Dr. Foster, given full

authority to equip the hospital, obtained such supplies as he could from the local commissary and purchased the remainder. Payment therefor was made by the commissary. A medical commissary was authorized May 15, 1775, to receive, store and issue the colony's medical and hospital supplies, and to impress beds, bedding and necessary furniture giving the owner a receipt therefor. Dr. Andrew Craigie was elected to the position. Additional hospitals were opened, as the need required, in the towns occupied by provincial troops. Suitable buildings were rented and remodeled for the purpose. Separate hospitals were established for smallpox and other contagious diseases. Provision was made, also, for the care of the insane.

A medical committee was appointed June 12, 1775, to devise ways and means for providing the troops with medicine and supplies. Another committee was directed to prepare plans and regulations for hospitalizing the sick and wounded. The battle of Bunker Hill was fought June 17, 1775, and lost for the want of supplies—ammunition. The wounded from this battle taxed existing hospital arrangements to their utmost and called for increased facilities, which were provided as rapidly as they could be secured. But there was as yet no director for all these general hospitals. Each was more or less independent, acting on its own initiative. The need for a chief of the medical establishment was not only apparent but urgent. The Provincial Congress set apart July 7th for selecting a surgeon general for the Massachusetts forces. Action was postponed until the following day but the records do not show the result of those deliberations. It is probable that no one was selected because the Continental Congress at the solicitation of the Massachusetts Congress had, on June 15th, voted to assume responsibility for the Army at Boston and selected George Washington as Commander in Chief. He had arrived at Cambridge July 2nd and the provincial legislature had informed him of the provisions already made for the care of the sick and wounded.

General Washington familiarized himself, as rapidly as he could, with the state of the Army, the medical establishment as well as the rest. What he found appears in the following extract of his letter of July 21, 1775, to the President of the Continental Congress.

I have made inquiry into the establishment of the hospital and find it in a very unsettled condition. There is no principal Director, or any subordination among the surgeons; of consequence, disputes and contentions have arisen and must continue until it is reduced to some system. I could wish it were immediately taken into consideration as the lives and health of both officers and men so much depend upon a due regulation of this department.

But ere this report had been penned the Continental Congress had appointed a committee to draft legislation for a hospital establishment for the Army intended primarily for the treatment of such sick and wounded as were too ill to receive proper treatment from the regimental medical service.

After some deliberation Congress, by a Resolve of July 27, 1775, provided such an establishment, described as a hospital for 20,000 men. Whether this enactment contemplated a basic unit for an army of that size wherever operating, or whether Congress could not visualize a military force or exigency other than the one then at Boston, cannot be determined. The latter supposition appears, in the light of subsequent developments, to be the more probable. In any event the legislation was most meagre and the authority and powers vested in the chief of the establishment were very circumscribed and limited.

The arrangement of the establishment authorized by this legislation was one director general and chief physician, responsible to the Commander in Chief; four surgeons for the management of hospitals; twenty mates to provide attendance; one apothecary to compound officinals and prepare them for ready dispensing; one clerk to keep financial accounts for the director general and property accounts for the hospitals; two storekeepers to store, safeguard and issue supplies to and at the hospitals; and for each hospital

one matron, one nurse for every ten patients, and such laborers and attendants as the day's need might require. The director general was authorized to appoint all personnel of the establishment except the mates whose selection was left to the surgeons.

The director general was empowered to provide medicines, instruments, dressings, hospital furniture and equipment, and all other articles needed for the care and comfort of the sick. He obtained the necessary funds from the paymaster with the army upon warrants signed by the Commander in Chief. All his supplies he purchased where, and as he could. Some of these such as sheets and linen rags for lint, compresses and bandages, leather for splints, web for tourniquets, tape, thread, needles, pins and even blankets were obtained by requests sent to the Selectmen of the various municipalities, by appeals to the clergy and by advertisements inserted in local newspapers. The director-general's accounts of purchases, as well as his reports of the operation of the hospital, were laid before the Commander in Chief and by him submitted to Congress.

As a result of the enactment of July 27, 1775, the Army had two entirely distinct and separate medical services, general hospitals and regimental. Neither was made subordinate or responsible to the other. They had no common chief to direct their activities, unless it was the Medical Committee of Congress, to which both could look for guidance and help in solving their difficulties. The authority of the director general did not by legislation extend beyond the general hospitals. Such authority as he had over medical affairs in the regiment was delegated to him by the Commander in Chief, in orders and otherwise. As a result there was no coördination of activities and very little cooperation between them. Regimental surgeons were ambitious and jealous of their authority. They endeavored to magnify the importance of the regimental hospitals and resorted to many subterfuges to avoid

sending their patients to the general hospital. To support their pretensions of importance these regimental surgeons made demands upon the director-general for excessive quantities of medicines and hospital stores, much of which, it is feared, were used for private purposes. When these demands were not or could not be approved by the director-general, the regimental surgeons complained to their respective colonels. Strife and contentions became rife. Let us hear General Washington's comment and orders in the matter:

Repeated complaints have been made by the Regimental Surgeons that they are not allowed the proper necessities for the sick before they become fit objects for the general hospital, and the director-general of the hospital complains that, contrary to the rules of every established army, these regimental hospitals are more expensive than can be conceived, . . . indicates either an unpardonable abuse on one side or inexcusable neglect on the other * * *. Courts of inquiry will be appointed by the various brigade commanders to inquire into these complaints. Soldiers too sick to remain in camp are to be sent to the general hospital. There is no need of regimental hospitals without the camp, when there is a general hospital so near and so well appointed.

Some order and harmony were established as a result of these measures and the authority of the director confirmed. The controversy was destined to be renewed the following summer at New York by the regiments of militia sent there to reinforce the Continental Army.

The regimental surgeon was not without grounds for complaint. He had no one to look to for his supply of medicines and dressings except the Medical Committee of Congress, unless he received them from the general hospital on authority from the director-general. He was, to a very large extent, an orphan. For a better understanding of the situation a brief consideration of the equipment of a regimental hospital is desirable. As to manner of housing, two or three large tents were provided for use in the field. When billeted in cities a suitable house was selected by the regimental barrackmaster. When in winter encampment, a hut was provided in which to hold sick call. For beds and bedding, bunks if provided at all, were

built by an artificer of the regiment. Each company was required to carry two empty bed sacks for use of the sick. These sacks were obtained by the company commander from the regimental clothier. When required for use they were filled with straw provided by the regimental quartermaster. For covering, the sick soldier had his own blanket supplemented, perhaps, by additional blankets loaned to the company commander or the surgeon. The cooking utensils, pots, pans, tin cups, and the like, the surgeon obtained from the quartermaster. Such articles of furniture as were required and could be furnished were also supplied by the quartermaster. No provision was made, however, for provisions for the sick. Such food supplies as were had were articles of the ration, supplied by the regiment. The surgeon had no personnel to look after his patients. Attendance, except the feeding, was rendered by the surgeon and his mate. For each regimental hospital a guard of three men was allowed. Of these one stood his tour of duty as sentry. The other two were available to help care for the patients.

For his professional equipment each regimental surgeon was supposed to have a chest of medicines, some instruments, and a few dressings. No list of medicines authorized for the medicine chest has been found. Perhaps it can be visualized from the list of those furnished the ship *Marquis de la Fayette* by surgeon Jonathan Drowne in 1782 and the following reported short by the Surgeons at Fort Ticonderoga, August 31, 1776.

Acetic acid, common;	Myrrh,	Radix Serpentar, Virg.
Aloes Hepatica,	Hordeum common	Sal Epsom,
	(barley),	
Calomel,	Mercury Precip. rubrum,	Sal Nitre,
Emplastrum Diachylon,	Mercury Corrosive Subl.,	Spts. Sal Ammoniac
Gum Guaiac,	Pulv. Cortes Peruviana,	Tartar Emetic
Gum Opii	Pulv. Ipecac	Unguentum Diachylon,
Cantharadis	Pulv. Jalap	Elixir Asthmatic,
Gum Camphor	Pulv. Rheum	Elixir Vitriol

LIST OF MEDICINES FOR YE SHIP MARQUIS DE LA FAYETTE

Calomel	5-jj.	Ext. Saturn	5-jjj.
Tartar Emetic	5-jj.	Ung. Mercurial	1b-j.
Gum opii	5-ss.	Ung. Basilicon or Digast... 1b-jj.	
Pulv. Ipecac	5-jv.	Cerat. Epulot	1b-j.
Pulv. Rhei	5-jv.	Sal. Cathart.	1b-jj.
Pulv. Jalap	5-jv.	Sal. Nit. ppt.	1b-j.
Pulv. Cort. Peruv.	5-jv.	Sal. Ammon. Crud.	5-jj.
Cortex Peruv.	1b-j.	Sem. Anis.	5-jv.
Elix. Vitriol	5-jj.	Lard	5-jv.
Elix. Proprietat	5-jj.	Sapo venat	
Flor. Chamom	5-vj.	Manna	
Flor. Sulph.	1b-jj.	G. Arabic	
Laud. Liquid	5-jj.	Cream Tart.	
Vin. Antimon	5-jjj.	Tinct. Myhrr et Aloes.....	
Emp. Diach. Simp.	1b-j.	Liniment Arcai et G. Elami..	
Emplast cum Gum	1b-j.	Syrup Scillit	
Emplast Melilot	1b-ss.	Conf. Rosar rub.	
Emplast Mercurial	1b-ss.	Merc. precip. rub.	5-j.
Pill Cochia		Merc. corros. sub.	5-ss.
Pill Rufi		Cantharidis pulv.	5-j.
Balsam Traumati		Camphor	5-jv.
Spt. Volat		Vitriol Roman	5-j.
Spt. Terebinth		Vitriol Album	1b-jss.
Ol. Olivar	1b-jj.		

1 case Amputating Instruments.
 1 Case Trepanning Instruments.
 1 Case or pouch Dressing Instruments.
 1 Case Artery Needles.
 3 Good Lancets.

Lint1b-jjj.
 Carded Tow1b-jjj.
 Old Linens
 Pins
 Silk

Rice
 Oatmeal
 Indian meal

A tin Coffee pot.
 4 tin Quart pots.

1 doz. Common Stick Tourniquets.
 1 Brass petit Tourniquet.
 Syringes.

.... Mortar.
 Scales and Weights.

Thread
 Wax
 Sponge
 Ligatures
 Splints

Bandages
 Claret wine
 Vinegar

10 tin Pint cups.
 Spoons, &c.

A medical friend to whom the director-general applied early in 1776, replied "To give you a long list of medi-

cines, etc., (used in an expedition in the last war) would avail you little at present, as many of the articles are not to be had; nay I am certain, one half of them might at any time, be left out."

The following surgical outfit was recommended by the director general

Instruments for Surgeon
and Mate

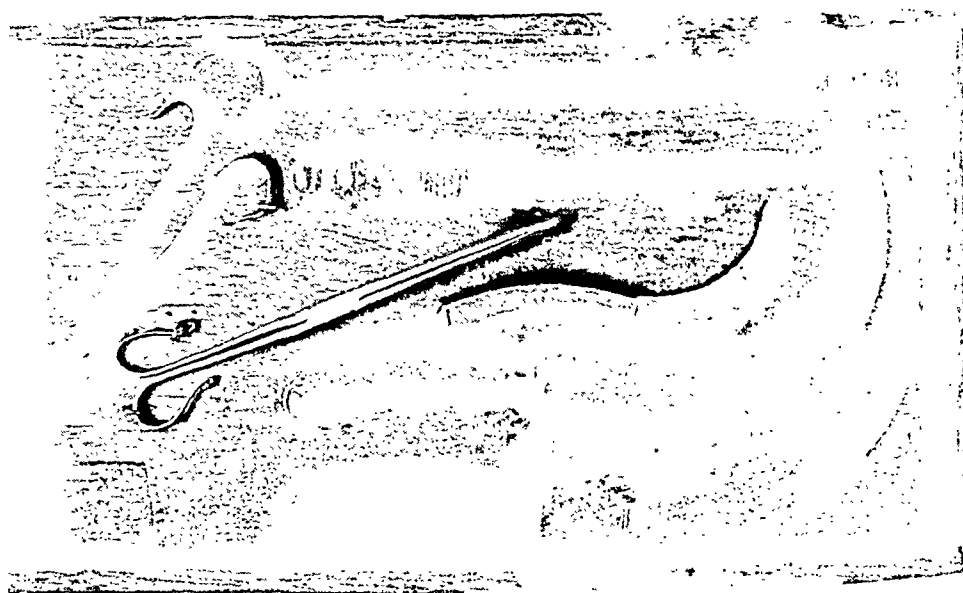
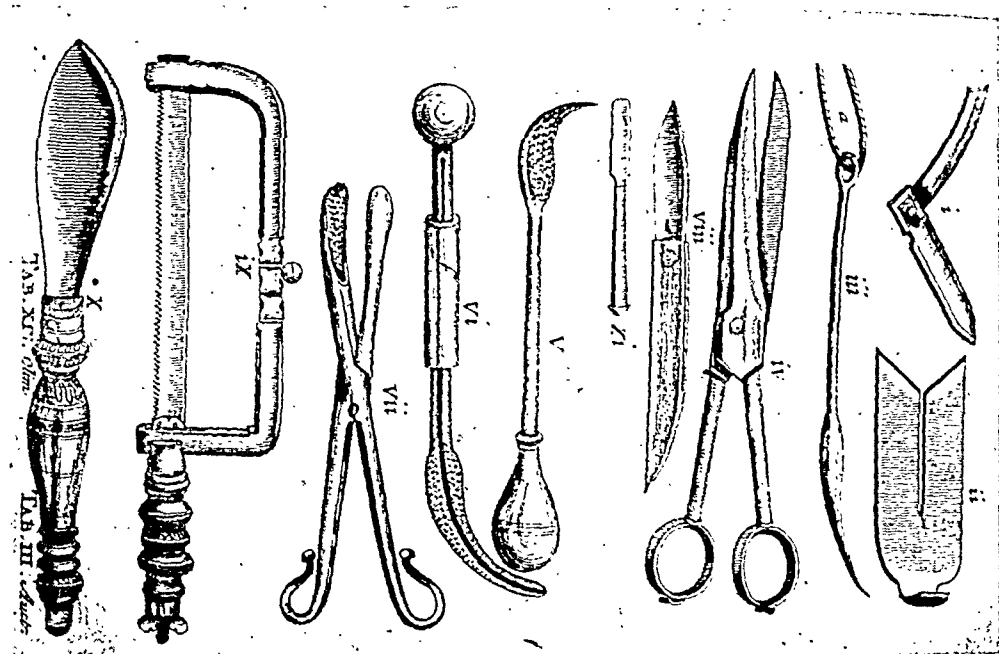
Bandages, etc.

Linen, etc.

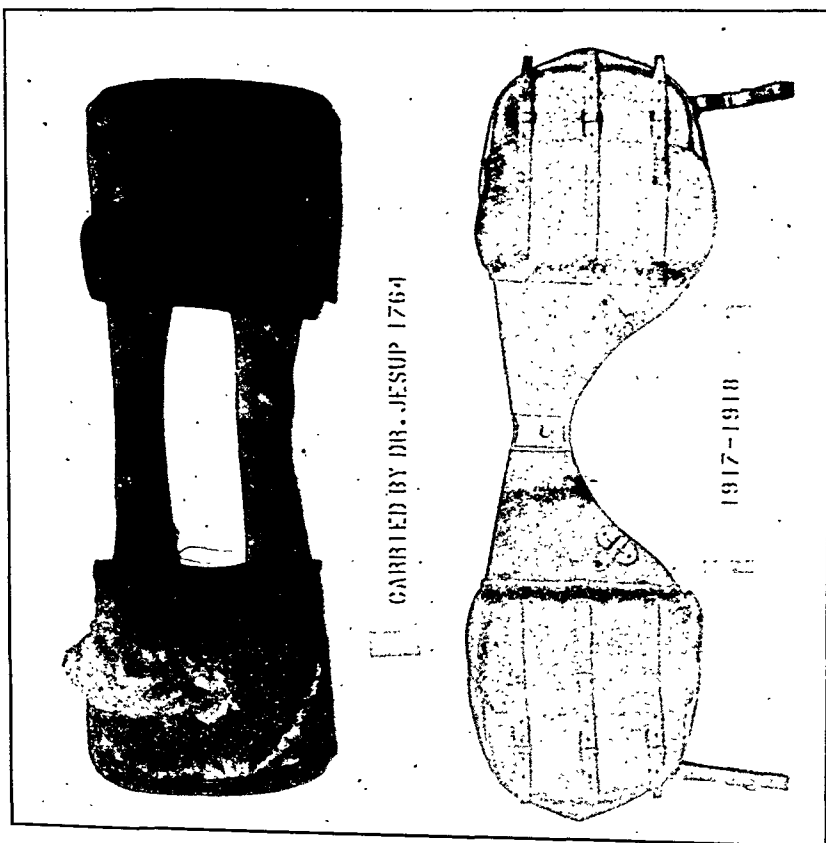
A set of amputating instruments consisting of at least	Of Bandages, Rollers, &c., of various kinds, at least 300.	Six pairs of old sheets or rags equivalent for compresses, &c.
A large knife	One or two dozen sets	Lint, 2 or 3 pounds at least,
A saw with 2 blades	of splints,	
A catline	2 dozen common tourniquets,	6 ounces of sponge
12 crooked needles	3 ounces of thread for ligatures.	6 pounds of fine tow.
A screw tourniquet		
A case of six incision knives	A piece of 2 inch wide tape.	
2 sets of pocket instruments	16 or 18 inches square of sadler's leather, and a piece of sadler's inch wide girding.	
4 bullet forceps		
An artery forceps		
2 dozen straight needles	Bandages, tourniquets, splints, &c, should be made by the Surgeon and Mate.	
A paper of pins		
A case of lancets		

For this equipment he recommended that each surgeon have a portable box, with suitable divisions for containing his lint, bandages, instruments, and other implements of surgery.

Some conception of the instruments of the period, a few of which were undoubtedly included in the regimental equipment, may be gathered from the following illustrations.



No medicine chest of this period, the authenticity of which can be properly vouched has been located although the search has been extensive. Nor has there been found any cut or description of it. A saddle bag, carried by Dr. E. Jesup, surgeon of colonial troops in the campaign of 1764, is in the possession of Mr. Arthur S. Jesup of this city, a direct lineal descendant, through whose courtesy the following illustration was obtained. In one pocket of this bag is some of the tow issued for dressings.



For removal of the wounded from the field of battle regimental surgeons were instructed to make arrangements with regimental officers for a supply of hand barrows,

wheel barrows, or other suitable biers and for men to carry them. For evacuating the wounded, the Quartermaster was directed to provide a number of suitable wagons. Just what type of wagon was considered suitable for this purpose has not been discovered, whether the standard freight wagon, a lighter wagon, or some type of spring vehicle. Ambulances as such had not been devised. The Quartermaster was, by later legislation, directed to provide "litters."

The disabilities of the regimental surgeons were, in part removed, and the supervision and direction of the director-general and directors of separate establishments over them was extended and better defined by the resolve of July 17, 1776. This resolve also increased the number of hospital surgeons and mates at the rate of one surgeon and five mates for every five thousand men in the whole army. An increase of personnel for these hospitals in stewards, storekeepers, matrons and nurses was authorized. Regimental medical and surgical equipment and supplies were placed under the supervision of the directors who were made responsible for their replenishment. The provisions of this resolve affecting regimental hospitals were published to the command in the following order from General Headquarters, New York, July 27, 1776:

"The General, finding the number of sick to increase, and being desirous to have them as well accommodated as possible, directs that the Barrack-Master . . . of each regiment fix on some house convenient to the regiment, to be improved as an hospital for the reception of patients just taken down, or whose disorder does not require any special assistance beyond that of their own Regimental Surgeon. One of the surgeons of the hospital will occasionally visit these hospitals, and determine when the nature of the case requires the patient moved to the general hospital, which will hereafter be kept in different houses contiguous to each brigade.

The regimental surgeons are to receive directions from, and be responsible to, the Director General so far as respects the furnishing their regimental hospitals with conveniences for their sick. The regimental surgeons are also to keep a register of their sick, and make a weekly return to the Director and Commissary general severally, of the sick in their respective regiments.

Whenever a person is taken sick he is not to be borne on the provision return; but the value of his ration be obtained in suitable supplies from

the general hospital, to be drawn by the surgeon of the regiment, who is to conform to the rules of diet established in the general hospitals, and to account to the Director General.

The legislation of July 27, 1775, had another serious defect. Whether by intent or inadvertence the authority of the director-general over hospital affairs was not extended beyond the establishment with the main army. Almost before the ink of the signature to that resolve had time to dry another hospital establishment became necessary. Without so much as a scratch of authority from even a provincial Congress a band of colonial troops under Ethan Allen had early in May seized the very important strongholds of Ticonderoga and Crown Point securing a large number of cannon and vast quantities of military stores. The immense advantage to the colonies of possession of these strongholds was at once apparent. Additional troops were dispatched to hold them and plans prepared for an early invasion of Canada before Great Britain could have time to reinforce her garrisons there. A General Officer was detailed to command the troops there assembled and thus a new army was formed and the Northern Department created. Instead of placing hospital arrangements for this army under the director-general of the main army and increasing his authorized personnel accordingly, Congress by resolve of September 14, 1775, created for it a separate hospital establishment only a little inferior to that of the main army. The director of this establishment was authorized to appoint mates and other hospital personnel. The deputy commissary general of the department was instructed to pay the director for such medicines as the latter had purchased for the use of the army and to procure such other medicines as he might be directed by the commanding general to do.

But Congress did not stop with that of the Northern Department in its creation of separate hospital establishments. Another was authorized May 18, 1776, for the forces in Virginia and the Colonies to the southward. Still another was authorized July 15, 1776, for the Flying

Camp established at Trenton for the rendezvous of Militia Regiments en route from Pennsylvania and near by colonies. Each of these establishments was under a director appointed by Congress and authorized to appoint his own staff and hospital personnel as the need of the service required. Congress may have attached less importance to these establishments and intended to make them secondary to that of the main army but there is no evidence of any intent to make them subordinate or responsible to it. Distance from the main army and difficulty of communications justified, in a large measure, the independence of the establishment in the Southern Department, but the same cannot be said of the others. This arrangement with division of responsibility and authority had its usual result in bickerings, controversy, and confusion. The directors of separate establishments when in need of supplies demanded them from the director-general, who, while willing to help, did not consider his authority wholly adequate. The directors endeavored to shift the responsibility for their deficiencies to the shoulders of the director-general. The inevitable happened for Congress, without according a hearing to either of them, on January 9, 1777, summarily dismissed both the director-general and the director of the Northern Department.

The vicissitudes and disaffections which resulted in the dismissal of the director-general at last convinced Congress that a complete reorganization of the medical establishment was unavoidable. A plan of reorganization proposed by Dr William Shippen, Director of the Flying Camp, and Dr. James Cochran, hospital surgeon, transmitted to Congress February 14, 1777, by General Washington, served as the basis for consideration. The discussion was prolonged. The draft submitted by the Medical Committee was twice recommitted for further study. The measure as it finally appeared in the Resolve of April 7, 1777, was a distinct improvement over its predecessors. The authority of the director-general was extended over the establishments in all territorial departments or districts. He was represented in each department by a dep-

uty director-general. Supervision of professional service in general hospitals was vested in a physician general and a surgeon general for each department who probably functioned as consultants. The purchase of medical and hospital supplies including special diet was devolved upon the deputy directors general. Each department was allowed an apothecary to handle pharmaceutical supplies, a hospital commissary to provide provisions, forage, and other like articles, and a clerk to keep financial records, prepare financial reports, and act as paymaster. Each hospital was allowed senior and junior physicians or surgeons, according to the class of patients treated, and mates to assist them, hospital stewards, matrons, nurses, and a hostler.

The resolve also provided a definite field organization under a physician and surgeon general for each army. This was wholly an army unit, intended to supervise the regimental medical service and to provide temporary shelter and treatment for the sick and wounded while the troops were in the field. It functioned also, in similar manner, while the troops were in winter quarters. Out of it grew the flying hospital, the ante-type of the modern evacuation hospital. The deputy directors general represented the departmental organization and had supervision over the general hospitals and the detached military units not with the army but needed for the protection of certain defensive points. These officials had fixed stations and did not travel with the army. The duties of all officials in the medical establishment were sufficiently well defined in the resolve to leave no doubt as to their mission.

Subsequent legislative enactments of February 6, 1778, September 30, 1780, and January 3, 1782, reorganizing the medical establishment served gradually to form it into one uniform corps, responsive to a single administrative head, and functioning as a harmonious whole. The providing of all medical and hospital supplies was ultimately vested in a purveyor thereby wholly separating practice from purveyorship, a condition frequently criticized by Congress.

With the demobilization of the army following the proclamation by Congress, April 11, 1783, of cessation of arms as well by sea as by land, this admirable medical organization built up with such effort disappeared. After the discharge of the purveyor, October 31, 1784, not a vestige of it remained. For many years thereafter the entire medical service for troops was rendered by regimental surgeons and mates in post or camp hospitals where stationed.

In 1792, as a result of a disastrous defeat in an Indian campaign of the previous year, the army was increased and reorganized as the Legion of the United States. This Legion was composed of four sub-legions having 1,280 enlisted men each, formed into two battalions of infantry, one of riflemen, and one company each of dragoons and artillery. A surgeon was authorized for each sub-legion and a mate for each battalion. A Legionary Surgeon, member of the Legionary Staff, supervised the Medical establishment.

In 1798 war with France appeared inevitable. The Army was increased, additional surgeons and mates authorized but no provision was made for a hospital department. This defect, being criticized by the Secretary of War and the criticism concurred in by the President, was remedied by the Act of March 2, 1799. This act contemplated a single uniform corps which, exclusive of regimental surgeons, consisted of the following persons:

A physician general as chief, who was charged with the general supervision and direction of all military hospitals, of the medical and surgical practice or service in the Army and Navy, and of all employees of the Medical establishment in hospitals, camps and garrisons; an apothecary general with one or more deputies, charged with the storage, preservation and issue of all medicines, instruments, dressings and other articles required by the hospital and regimental service; a purveyor whose duty it was to procure all medical and hospital supplies; an adequate number of hospital surgeons, liable for field service, charged

with the administration of hospitals to which assigned; a suitable number of mates to perform, under direction of the surgeons, the ordinary duties in the care of the sick in hospitals; and for each hospital a steward, and a competent number of nurses. The act provided for a medical board whose duty it was to examine all candidates for employment in the hospital department and certify to the Secretary of War their respective qualifications. The act further provided that regulations for the management of hospitals and the government of nurses and others charged with the care of the sick in camps and hospitals be prepared by a board consisting of the physician general and two hospital surgeons. These regulations became effective after approval by the Commander in Chief and the President.

At the urgent request of General Washington, his intimate friend and personal physician, Dr. James Craik, who had served as chief hospital physician during the Revolution, was appointed physician general and the necessary steps taken to organize the Medical Department. This organization had scarcely been completed before the war scare passed and the provisional army demobilized. With this demobilization the central organization again disappeared. In the return of the Army to peace time footing in 1802, provision was made for two surgeons and twenty-five mates for the army, attached to garrisons or posts and not to regiments. The Medical Department here for the first time, appears as a single corps. The number of mates was increased by six in 1804, and by five hospital surgeons and fifteen mates in 1808. The advent of the War of 1812 found the Medical Department in a most inadequate state without a central organization. The country was at that time divided into territorial departments and in each department the senior medical officer acted as chief surgeon of the military forces therein and as advisor to the department commander in medical affairs.

The act of January 11, 1812, for an additional military force authorized hospital surgeons, mates, stewards and

other hospital personnel, but made no provision for a central organization or directing head. It was not until March 13th of the following year that Congress reluctantly authorized it. The Act of that date for the better organization of the general staff of the Army created the offices of physician and surgeon general, and apothecary general, but left it to the President to prescribe their respective powers and duties. The following appears in the Army regulations of the period:—

It shall be the duty of the physician and surgeon general to prescribe rules for the government of the hospitals of the army; to see these enforced; to appoint stewards and nurses; to call for and receive returns of medicines, surgical instruments, and hospital stores; to authorize and regulate the supply of regimental medicine chests; to make out general half yearly returns of these, and of the sick to the war department, and yearly estimates of what may be wanted for the supply of the army.

The apothecary general shall assist the physician and surgeon general in the discharge of the above mentioned duties, and shall receive and obey his orders in relation thereto.

The apothecary general and his assistants will compound and prepare all officinals, and put up and issue medicines, etc., in chests, or otherwise conformably to the estimates and requisitions of the senior surgeons of hospitals, regiments and posts. Returns are to be made to the apothecary general's office, quarterly, by the deputy apothecaries, surgeons, and mates, or any one having charge of instruments, medicine, hospital stores, and hospital equipments of any description.

In addition to the central office just described the arrangement of the Medical Department as prescribed in army regulations contemplated a departmental or district distribution of its officers. The senior surgeon of each district was director of the medical staff in that district. of the Medical all military hospitals in his district, regi- and Navy, and ral, corrected abuses, took administrative ment in hospititions for medical supplies, and rendered general with on's of sick and wounded. He acted as age, preservationnmanding Officer on all matters affecting dressings and ofcommand. The regulations covered also regimental servicgeons in charge of hospitals and their cure all medical ;wards and ward masters, and those of ber of hospital s's and mates. A direct line of authority

and responsibility extended from the chief of the establishment to the least important attendant in the hospitals, general and regimental. Rank, which was only relative, was determined by seniority of appointment. Assignment to positions depended upon the qualifications and ability of the individual. The regulations further provided that no candidate should be appointed to the department unless he possessed a diploma from an approved medical school or had passed an examination by an army medical examination board.

- The Medical Department during this war appears to have been well organized, well administered, and to have, in the main, performed its mission creditably. It is true, the medical with other departments of the army, at the commencement of the war, wanted a system. Military hospitals were to be founded by gentlemen, little versed in hospital establishments for an army. These were evils, the necessary consequence of our civil policy and long period of peace, and which all new military establishments have to encounter; under the able supervision of Dr. James Tilton, the physician and surgeon general, these deficiencies were overcome. Some of the general hospitals had an enviable reputation for arrangement, administration and efficiency. The duties of the Apothecary General, Francis Le Baron, were performed efficiently as evidenced by the tribute paid him by Major Mann, chief surgeon of the Division of the Right in his Medical Sketches, "In justice to Dr. Le Baron, Apothecary General of the Army, it is with pleasure we acknowledge, he executed his duties with complete fidelity."

In returning the army to a peace footing in 1815, Congress again omitted all provision for a central medical organization or a chief to head the establishment, but gave the President authority, if he deemed it necessary, to retain provisionally the apothecary general and two assistants. This authority was exercised, and the apothecary general retained. An Act passed the following April definitely incorporated them in the medical establishment. The need for a permanent chief definitely to head the de-

partment was keenly felt by the Secretary of War. Finally in April 1818, an Act regulating the Staff of the Army was passed which provided:

Sec. 2. That there shall be one Surgeon General with a salary of two thousand five hundred dollars per annum, one assistant surgeon general, with the emoluments of a hospital surgeon, . . . and that the number of post surgeons be increased not to exceed eight per division.

Thus was established the central administrative organization of the Medical Department which continues to the present day, and Dr. Joseph Lovell, appointed the first surgeon general under that act, has not lacked a successor for the position he so ably filled until 1836. The changes made in the organization and arrangement of the Medical Department since that date have been few. Its personnel has been augmented during each war in which the United States has been engaged and reduced after the temporary forces have been disbanded. Volunteer forces raised to augment the Regular Army during these wars, have been attended by volunteer Medical personnel who have functioned under and been subordinate to the Surgeon General. In 1888, the Hospital Corps, an enlisted force was made a part of the Department. In 1901, a force of dental surgeons were added, employed for a number of years under contract, but incorporated in the Medical Department as the Dental Corps by Act of March 3, 1911. The Army Nurse Corps became a part of the Medical Department by the Act of February 2, 1901. The Medical Reserve Corps was authorized by Act of April 23, 1908, and proved of inestimable value to the Medical Department both prior to and during the World War. And lastly, the Veterinary Corps was added by the National Defense Act of 1916. The designation Medical Corps was given the commissioned personnel of the department in 1908.

ALLUSIONS TO MEDICINE IN CLASSICAL LITERATURE *

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It is an interesting thought that if each of us stood up with his father and grandfather in a row, our lives would cover approximately a century, if our grandfather's father and grandfather could do the same, a second century would be covered, and if the process were continued back to the birth of Christ, we would have approximately sixty men, representing sixty generations. If this were continued back as far as the time of Hippocrates in the fifth century B. C., we would have seventy-five generations, and to the time of the siege of Troy when Machaon and Podalirius were surgeons to the Greek army, we would have about one hundred men standing in line, about the size of a company of infantry. Many interesting reflections accompany this thought; among others comparing the time during which these generations have been on earth with the millions of years that man has existed, it would seem that on the whole our fathers, back to the time of the Trojan war, must have been much the same men as we are, for in so few generations how could much change be affected by evolution? When we think on the other hand of the progress that our profession has made, especially in the last two hundred years, or since the time of Harvey, it seems impossible that during the duration of the lives of not more than one hundred men so much should have been accomplished.

An interesting thought also is that together with philosophy, science and the plastic arts, the latter of which rose in Greece during the fifth century B. C. to heights that have never been surpassed, the science of medicine reached a stage, culminating in the Hippocratic School, of great advancement. The principles established by this School, as continued by the School of Alexandria, reached

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in the time of Galen a stage where progress ceased, and Greek and Roman medicine had to suffice for the profession through the long period of the dark ages, until at the time of the renaissance, medicine together with the arts and sciences began to advance with a rapidity which has gradually increased in momentum until the last one hundred years. During this period the science of medicine, in contradistinction to the art, has gone ahead so fast that no one can keep up with it. Indeed, our students are apt to forget, in the scramble of the acquisition of knowledge, that there is such an art. In no way can the principles upon which medicine are founded be so well impressed upon our students as by reading judicious selections from the writings of Hippocrates. In ethics we have not improved upon the Hippocratic Oath, and in some ways many of us fall below it. How about our loyalty to our teachers?

Hippocrates seems to us to have lived long ago, but, strange to say, wrote a treatise on ancient medicine. So medicine must have been ancient in his day, and have made progress from the stage of Aesculapius, the witch doctor of Tricca, the son of Apollo, who was ushered into the world by a very crude Caesarian performed by his reputed father, and made himself such a reputation for curing the sick and raising the dead that he, with Hercules and Dionysius was translated to Olympus and at his death became a God.

What were the influences which during the few hundred years from the Trojan war to the great fifth century, enabled our profession to develop an Hippocrates? From the very beginning of the magic and priestcraft of these early days, there must have been those among the priests who observed and thought about their work. They probably gathered from the instinctive knowledge of mothers, the first and best of nurses, the principles applicable to caring for their children, and applied them to making comfortable those suffering grown-up children, the sick. The worship of physical perfection, so highly developed

among the Greeks, made worth while the care of the body. The first recorded Olympic games took place in 776 B. C. Undoubtedly there were many games and much study of training methods before that period, but Hippocrates had the advantage of the knowledge gained by observing the training of athletes during the two and a half centuries since the first Olympiad. Didn't the Asclepiadae, of whom Hippocrates was one, learn during these generations to place their temples, as at Epidaurus, in cool pleasant groves, with a good water supply? Even as in our day some of the quacks and cults have learned much about the care of the sick, so not improbably the Priests of Aesculapius gradually progressed from pure magic to real medical and surgical therapeutics. Hippocrates freed his school from priestcraft. Yes, medicine was ancient in his day. From his treatises one may learn the principles of diet and regimen upon which the care of the sick was then, and still is, dependent. It is good for us to think upon the trouble with quacks and cults we have to-day, and then reflect upon the difficulties the heroes who rationalized Greek practice must have undergone in weaning their people away from the magic and sorcery of the priests, which was so intimately interwoven with their religion. The priests were the regular practitioners. There were no boards of registration in medicine or laws regarding medical practice. To combat all these difficulties, medicine had to be founded on principles that would stand, and, in spite of the humoral pathology and principles taken from philosophy, it was. One cannot get the most out of Hippocrates or Galen unless he can read and criticise them in their own language. Would that some Greek Harvey Cushing had written a biography of Hippocrates! But I am not after all delivering a treatise on Greek medicine. I want to tell you how much fun a medical man can get out of the classics. Leave aside the fact that a new world is opened in philosophy, poetry and history. In these fields the Greeks were the "pioneers," the lads that cleared the way, to borrow a phrase from Aeschylus, and after all life, even medical life, is a little more than practice. Are we worse

with painfully inferior results. Such courses which, in great part, would be a pure waste of time to one with a respectable classical foundation, are a poor substitute, a superstructure without base. No study of English grammar, no accumulation of courses on English composition, can teach one his own language so well as the study of Greek and Latin and practice in the translation of classical masterpieces into English; and may we not fairly ask if we are saving time?

"In some respects, and very important respects, the American college graduate to-day is a child compared to his British or continental brother. In some ways he is very apt to remain so throughout his life. He lacks that power of comprehension and expression which facilitates intercourse between cultivated men. The lack of this power in some of our foreign representatives prevents mutual understanding and leads to suspicion. It is not an accident that our best representatives in the Mother Country have been scholarly men. He who cannot appreciate the nuances of the language of them with whom he is dealing, he who cannot express his own thoughts with like freedom, is at a disadvantage. Aware of this disadvantage he becomes uneasy; he suffers from a sense of conscious or sub-conscious inferiority; sensitive, suspicious, and irritable, he is very likely to assume an attitude of self-defense and to betray his discomfort by assertiveness, ill nature, and bad manners. This may seem strong language, but in the experience of the writer, who feels deeply the relative meagreness of his own classical training, it is quite true.

"Foreign scholars who have spent periods with us are polite in their language but deeply impressed by the mere handful of Americans who have obtained that classical foundation which, to them as to us, appears to be one of the basal requirements of a liberal education."

If we wish to give a medical turn to our classical studies, let us gather up from the poets and philosophers the way in which the early physicians were misled in matters of

anatomy and physiology. How the poet Alcaeus wrote a poem about the dog days, beginning: "Moisten your lungs with wine for the dog star shineth bright, . . ." and how physicians and philosophers, including Plato, believed that drink went through the trachea into the lungs, and solid food only through the esophagus, into the stomach. How the great Alexandrian School of anatomists discovered the epiglottis, which looked as if it would keep liquids out of the esophagus, and Erasistratus found that it did, while others compromised and said that the epiglottis was so finely balanced that it let just enough fluid in to moisten the lungs, while the bulk of it went into the stomach. They were puzzled about how the fluid got from the lungs to the bladder, even down to Galen, who proved that it came from the kidneys by ligating in public the ureters of living dogs and showing the dilatation of those organs and the retention of the urine in the kidneys until he took off the ligature and let the urine run into the bladder. I cannot help thinking how Galen would have enjoyed the moving pictures of the passage of the urine through the urinary system which Dr. Squier showed at the recent meeting of the College of Surgeons in Boston. By the way Erasistratus, mentioned above, was a grandson of Aristotle, being the son of his daughter. He gave up practice to study and teach anatomy. To him and his equally great contemporary, Herophilus, of the torcula Herophili, we owe many advances in our knowledge of the nervous system which was further extended by Galen, that tremendous character, court physician to Marcus Aurelius, anatomist, writer, bitter controversialist, experimental physiologist and admirer of the great founder of medicine, Hippocrates. How near he came to solving the problem of the circulation of the blood! In the writings of Aulus Gellius, among the curious notes about philosophy, grammar, mythology, poetry and the like is an interesting note on what a layman could get out of the medical writers of the time about the circulation of the blood. Aulus Gellius was what we would call a superior court judge in Rome about the time of Galen, and spent

some time studying in Athens with Taurus, the philosopher. One summer he was visiting a salubrious resort called Cephisiae near that city, to escape the heat, when he was attacked by a fever. He called in the local physician, who was feeling his pulse just as Taurus, the philosopher, and some of his friends came to visit him, and the doctor remarked to Taurus—"You can feel the pulse in his vein yourself and see that the fever has left him." Taurus remarked: "We are convinced, my good man, that you are not ignorant of the meaning of the words vein and artery, and that the veins do not pulsate, and are opened only for the purpose of bleeding, while the arteries by their pulsation demonstrate the quality and extent of fevers. No doubt you were speaking in the vulgar fashion as others do; try and be more accurate in your therapeutic methods than in your manner of speech." Gellius goes on to say that he thought not only physicians but laymen ought to know something about our bodies. He got hold of some medical books and found that the veins are only receptacles for blood, or vessels, containing a mixture of blood and vital spirit, with a preponderance of the blood, while the arteries contain more vital spirit in proportion to the blood, and that the arteries had pulsation, which he defined as an "involuntary systole and diastole on the part of the arteries and the heart." Substitute oxygen for spiritus vitalis and how near we are to our modern knowledge. Galen believed that the arteries and veins communicated at their terminations, but he was thrown off by his imaginary openings connecting the right and left ventricles, which imaginary connection was not disproved till many generations further on, when Michael Servetus suggested that in order to get from the right to the left side of the heart the blood might have to pass through the lungs, for which heterodox opinion, among others, he was burned at the stake.

Illustrating the interest and spirit with which Galen went after his anatomical studies, I cannot help telling you the story of Galen and the elephant. Galen described the mammalian heart as consisting of two cavities, the right

auricle and ventricle and the left auricle and ventricle being described as each one cavity. He had also described what he called bones in the human heart, finding them in the hearts removed after death from aged men. I presume he referred to calcified valves. He had found a "bone in the heart of a full-grown deer." He had never dissected an elephant's heart, but thought that that animal, being so much larger than the others, probably had four cavities instead of two, and that the elephant's heart certainly would have a bone in it. One day in the gladiatorial shows an elephant was killed, and the heart was sent to be cooked as a special delicacy for the emperor, Marcus Aurelius. Now Galen, as court physician, was on good terms with the Emperor's cook and went to the kitchen with his students, most of whom believed it likely that the elephant's heart would have four cavities. All of them, however, scoffed at the idea that there would be a bone in it. On examining the heart, it was found to have two cavities like the other mammals, but sure enough there was a "bone" in it. So Galen won half his wager anyhow. Galen was always on the alert for bodies to dissect. He availed himself of the bodies of men found drowned as well as malefactors hanged at the cross roads. He dissected and vivisected monkeys and apes, commenting upon the great similarity of their anatomy to the human, and enumerating the various apes and monkeys in the order of their resemblance to man. Most of his anatomy of the muscles is derived from his dissection of apes.

There is a lot of medical interest in that charming historian Herodotus, from whom we learn that the oculists of Egypt were very famous, one of them too much so for his own good.

He was sent for by Cyrus, the king of Persia, and detained so long against his will that he had to stir up a war between Persia and Egypt in order to get home.

Then there is the story of Democedes of Croton, the man who became so famous at home that he was called to

Aegina, Athens and Samos in succession as a public physician, receiving a very high salary. When Polycrates, the tyrant of Samos, who reached the height of glory and the extremity of disgrace, went on his disastrous expedition to Asia Minor and was crucified by order of Darius, Democedes, who was one of his retinue, was enslaved, chained and thrown into prison. When Darius dislocated his astragalus and the famous Egyptian physicians at court tried violent methods of reduction without effect, Democedes cured the king by mild and gentle measures. Would that there were space to tell how he won the friendship of the king and of Queen Atossa, whom he cured of an abscess of the breast, and how he won a promise that she would do anything for him that did not involve disgrace, and how through her influence he was sent by Darius to Greece as guide to a scouting expedition preparatory to his great invasion, how he managed to run away from the Persians and get back home to Croton, where he married the daughter of Milo, the famous athlete.

Herodotus states that not only were the Egyptian physicians famous for their skill, but there were specialists for every part of the body, including diseases of the brain, the jaws, the abdomen, etc. We are just now beginning to learn a little about Egyptian medicine, which was, we know, for centuries in the hands of the priests who assigned the various parts of the body by astrology to certain gods represented among the stars. To the priests of each particular God was assigned the part of the body under the God's jurisdiction. In Greece, specialism, if we may believe Eustathius, began with the sons of Aesculapius in the Trojan war, for he says, according to Hesiod: "For their father gave both of them gifts, making each more glorious than the other. To the one he gave hands more light to draw or cut out missiles from the flesh and to heal all kinds of wounds; but in the heart of the other he put full and perfect knowledge to tell hidden diseases and cure desperate sicknesses. It was he who first noticed Aias' flashing eyes and clouded mind when he was enraged."

I have spoken above of the advantages of reading the Greek authors in the original. One advantage is that one may find a real gem which is seldom quoted. There is one statement in Hippocrates' treatment of fractures that shows that the author was not entirely divine, and at heart had some human characteristics. This I never saw quoted. We know what compound fractures of the femur were before asepsis, even a few years before, and not two and one-half thousand years. Hippocrates, after speaking of the cases and discussing whether it were better to reduce the protruding ends of the fractured bones, says: "Whatever method is adopted, these cases are extremely serious, and the wise physician will do well to escape them, if he can do so gracefully." In other words, "let George do it." I cannot leave out of this rambling discourse a word about a reference to Hippocrates in Plato. In the *Gorgias* he compares medicine and cookery to illustrate the difference between a science and empiricism. But his reference to Hippocrates is of especial interest. He is trying to impress upon Adeimantus that one cannot attempt to know the nature of the soul until one knows the nature of the universe, and quotes Hippocrates as saying that we could not even know the nature of the body without some such, so to speak, preliminary training. It is interesting that our great philosopher should have hit upon such a broad and important principle among the others which we owe to Hippocrates. It is rather surprising that there are so few references to Hippocrates in Greek literature. However, if you think about it, I think you will find that most writing about the heroes of medicine is done by brothers of our own profession, who in the nature of things are the only ones who can really understand and appreciate their character and difficulties. Characters like William McLure are rare even in modern fiction.

The poet Theocritus wrote an epigram about his friend Nicias as he presented him with a little statue of Aesculapius. "Even to Miletus came the son of the Healer to succour the physician of diseases Nicias, who ever day by day draws near him with offerings, and had this image

carved of fragrant cedar, promising high recompense to Eetion for his cunning of hand; and he put all his art into the work." Some of the Greek writers of epigrams were rather sarcastic in their verse regarding physicians.

Horace in a charmingly characteristic "epistola" refers to Antonius Musa, a very successful physician at Rome in his day, who had cured the Emperor Augustus of arthritis by a system of cold baths. He afterward failed, it is said, by the same method in the cure of the young Marcellus, who died on his hands. He had a brother in Africa who was court physician to King Juba.

Asclepiades, about 200 years before Galen, was one of the first Greek physicians to practice in Rome. Galen flays him severely in his controversial writings. It seems he was educated as an orator, until he conceived the brilliant idea of applying his oratory to the treatment of patients, and naturally made a great success. Perhaps he did not know much about medicine at first, but he learned very rapidly. He certainly was a good observer. He noticed as a funeral procession was passing that the corpse moved slightly. He at once broke into the ceremony and went to work on the man, and resuscitated him. He gained the reputation of having raised him from the dead, which helped some. Asclepiades believed in the atomic theory, and founded his medical system upon it. He seems to have been a combination of homeopath and physical therapist of his day, and to have seriously upset the complacency of those who depended upon drugs. Pliny the elder has written charmingly and at length a medical herbarium which is quaint and curious, but shows a commendable and all embracing interest in his subject. Among other things he says of Asclepiades: "He did not make enough money out of oratory, and as he had a cunning mind which might be employed in other pursuits he suddenly turned to medicine, and as was inevitable in the case of a man who had never practiced or knew anything about remedies, with his copious and seductive eloquence, in which he daily indulged, he threw the whole system over-

board, and bringing the whole of medicine before the law for trial, said it was a matter of guess work. He offered five remedies as most important for all diseases,—abstinence from food, and sometimes from wine, massage, walking, riding,—and brought almost all the human race around to his views, no less than if he had been sent from heaven. He advocated hydrotherapy, to which his patients resorted most eagerly, and many other pleasant things for which they were grateful, with great authority.” He seems to have been a most sensible quack, but this is the reaction on the conservative Pliny—“With this alone we have a right to be indignant, that one man of the most dubious antecedents, with no resources back of him, simply to make a living for himself, should have promulgated for the health of the human race laws, many of which were afterward proved wrong.” There were many things that aided him—among others, “the somewhat uncertain and crude methods of the doctors of the old school, who used to pile the bedclothes on their patients and adopt every method to make them sweat, now roasting them in front of the fire, and hunting for sunlight in a cloudy city, now even throughout the entire Italian empire.” He was the first to coddle his patients by the use of shower baths for all purposes. Moreover he took the cruelty out of some of the older methods of treatment, as in angina, which they treated by forcing a tube down the throat. (Nowadays we merely dissect the cervical sympathetic ganglia, or did a few short months ago). He did a good thing when he condemned emetics, which were then used too often. (Think of our own practice a few short years ago). He argued that taking drugs was bad for the stomach, and for the most part, forbade it. (How reminiscent of recent history!) “And therefore we (Pliny) will indicate among the first three drugs which are an aid to digestion,” etc. According to Pliny he was much indebted to his exposure of the magic properties assigned to drugs by the Magi and other sorcerers. That would have been all right, says Pliny, if there had been any limit to human credulity, and we could not prove that Asclepiades’ claims for his own

system outdid those of the Magi for drugs and magic. All this and a lot more of Pliny is of interest as showing the attitude of the learned and conservative author to the art of medicine.

A few of the digs at doctors made by the Greek epigrammatists may be of interest. I have not run across any sketches like Dicken's portrayal of Tom Sawyer. But here are a few epigrams—One from Lucullus:

"A doctor sent me his son to be taught such verses as these,
'Sing the wrath and many the woes that were sent'
He learned them, but when we came to the following sentence:

'Many valiant souls he sent down headlong to Hades,'
He sent him no longer to me as pupil, and when
He saw me, 'Thank you,' he said, 'my friend, but my son
is quite able

To learn these things from me at home, for I also
Send many valiant souls down headlong to Hades,
And am not in need of a teacher to show me how.'"

Here are a few other uncharitable epigrams about doctors:

"Marcus the doctor called yesterday on the marble Zeus;
though marble, and though Zeus, his funeral is today."

"Diophantus, the astrologer, said that Hermogenes the physician had only nine months to live; and he laughing replied, 'What Cronus may bring to pass in nine months do you consider; but I can make short work with you.' He spoke, and reaching out, just touched him, and Diophantus, while forbidding another to hope, gasped out his own life."

"Diophantus, having seen Hermogenes the physician in sleep, never awoke again, though he wore an amulet."
On an oculist:

"If you have an enemy, Dionysius, call not down upon him Isis nor Harpocrates, nor whatever god strikes men

BOOK REVIEW

THE OSLER CATALOGUE

Bibliotheca Osleriana. A Catalogue of Books illustrating the History of Medicine and Science. Collected, Arranged and Annotated by Sir William Osler, Bt., and bequeathed to McGill University. (Edited by W. W. Francis, R. H. Hill and Archibald Malloch). xxxv, 785 pp., large 4°, Oxford, The Clarendon Press, 1929, 63 s. (3 guineas).

One rises from an evening over this extraordinary volume with an evocation of an almost forgotten past, repeating to oneself, it may be, the outmoded sentiment of some Victorian novelist—"Ah! those were spring days!" It is now something over a decade since Sir William Osler passed away at the close of the World War, yet here we are once more, some of us, in close touch with the man, sensing his unique personality on every page, vividly, even, in those bracketed marginalia on his beloved books (signed "W. O.") which are the essence of fine bibliography. This catalogue of the great collection just dedicated at Mont-real is a mammoth quarto, untempting to the sight, suitable for a monk's lectern at 45 degrees, hard on the *rectus abdominis* if read in bed, yet so alluring that the owner is apt to lose himself in it immediately, even into the small hours of the night. It would seem as if Osler were fortunate even in the time of his passing, for after 1918, he would have fallen, not necessarily upon evil days, to be weathered with the blithe serenity of his colleague Allbutt, who survived him five years, but upon a period in which the ethical, professional and personal ideals he lived for were broken down utterly, the *débâcle* of a great civilization, when even

"Strong Hades could not keep his own,
- But all slid to confusion."

Life goes on as before, with "business as usual," young people are more cheerful than ever, but not even Osler could now say, with the poet he once attended: "Give me the pay I have served for: take all the rest." This volume evokes memories of his universal friendliness to each and all, how he would go out of his way to cheer a colleague with the gift of a book out of the blue or an encouraging

acknowledgment of some trite reprint; his sympathy with young people; his charm as an essential Victorian gentleman of the younger school; the devotion of his pupils and friends; the tragedy which closed his life; his service to wounded soldiers in the war—

“Faithful, indeed, is the spirit that remembers,
After such years of change and suffering.”¹

The book is compact of the *nihil humani alienum* in Osler, that universal interest in all things human which Singer rightly styled “œcumenical.” The three editors, Francis, Hill, Malloch, with Mackall as Osler’s chosen sleuth-hound, have acquitted themselves nobly, making the dry bones live in a tome which will soon be prized like Håller’s great *Bibliothecæ*. As an introduction to medical literature far more instructive than those of Boerhaave and Young, it is a triumphant verification of Osler’s expressed view: “There is no better float through posterity than to be the author of a good bibliography.” It begins (following the editorial preface) with one of the most fascinating things he ever penned, an autobiographic sketch on “The Making of a Library.” There follows the great *Bibliotheca Prima*, an almost complete list of basic texts and related items illustrating the history of medicine and general science, from Lucretius to Röntgen. Some 67 names are featured in large type as outstanding leaders of science, very much as in Choulant’s *Handbuch* of 1841, and these Dr. Francis styles “Primarians.” No exception could be taken to the Osler Primarians up to the second half of the 19th century; but if one misses Semmelweis, Charcot, Graefe, Ludwig, Kelvin, Maxwell and some other prime movers, the list is after all, Osler’s own, representative of himself, and no more to be bickered over than an anthology of his (or another man’s) favorite poems.² The meaning becomes

¹ Emily Bronte.

² Such an anthology, revised by Osler before his death and printed by the Oxford Press in 1920, was unmercifully slashed by Solomon Eagle in one of his lively reviews. The poems are mostly Victorian and the only regret of the editors is that we did not include Shelley’s magnificent stanzas on Athens, which will be found in Robert Bridges’ *The Spirit of Man*, London, 1916, 93.

clearer in Bibliotheca Secunda, which includes names and texts of secondary importance. If one misses here the essential contributions of some of his old familiars—Villemin, Trousseau, Frerichs, Naunyn, Dejerine, Marie, Metchnikoff, *hoc genus omne*—it is at once apparent that, like Landor, he was always giving such items away to make room for others, to the value of a small fortune. Upon the advent of such newer men as Pavloff, Cajal, Aschoff, Emil Fischer, Loeb, Abderhalden, Schaudinn, Behring, Wassermann, Bordet, Carrel, Rubner, Gulstrand, the list obviously closes. Some items which deserve a place in this wonderful collection—e. g., Baillou, Werlhof, Cruveilhier, Magendie, Sir. W. Bowman, the pediatric compend of the younger Heberden, Goodeve's tropical pediatrics, Peacock on malformations of the human heart or the fragmentary history of medicine by Meryon (father of the famous etcher) will doubtless be added, as opportunity offers, by the faithful, who could have been of more material help in the master's lifetime had they realized the immense scope of his endeavor. By way of contrast, the third section, Bibliotheca Litteraria, is amazingly complete. We look for unusual medical poets like Campion, Lodge, Beddoes, Saint-Marthe, Littré, and sure enough, Campion *et al.* are there and even Sainte Beuve's fine *causerie* on Littré, with Osler's notation of its memorable close: "*Bien qu'il n'ait pas prononcé le fameux Serment qui lie au sacre-doce médical, il le porte écrit dans son cœur.*" Sections five (Bibliotheca Historica) and six (Bibliotheca Bibliographica) are made up of items on the history of medicine and bibliographic catalogues. Section seven (Incunabula) includes 104 items, apart from those cited in Bibliotheca Prima; and Section eight 132 MSS., notably of Albertus Magnus (1437), Ferrari da Grado, Haly Abbas (Arabic), Johannes Jacobi, Lancisi, Nicolaus of Cusa, an indenture of Edward Osler as surgeon's apprentice (March 22, 1811), G. B. della Porta (autographic), Sir John Harington's translation of the Salernitan Regimen, Constantinus Africanus and 15 early diplomas of the Universities of Bologna, Cambridge, Leyden, Padua, Pavia, Pisa, Rome, Utrecht

and Venice. The appendix "Osleriana" contains the Edgerton Y. Davis items and a list of such intriguing Osler MSS. as A Study of Dying, An Anniversary Address on Walt Whitman, Appeal to Hibernia Magna, Imaginary Letters from Fallopius & Co. on Howard Kelly's Operative Gynecology, A Lecture on Life in the Tropics, The Lessons of Greek Medicine, St. Thelema, The Nervousness of American Women, The Transatlantic Voice and so on. The volume terminates with a remarkable list of Sinhalese, Persian, Arabic, Hindustani and Sanskrit medical MSS. and books, presented by Dr. Casey A. Wood. Of the collections made by Osler himself, Harvey (165 items) and Sir Thomas Browne (162 items) are probably as complete as human endeavor can make them. The typography and proof reading are what might be expected from the Clarendon Press. Not only should Oslerians vie with Cushing and Mackall in adding missing classical texts of the smaller sort to this great collection, where possible, but should a second enlarged and revised edition appear, as seems probable, it could be made infinitely more valuable and viable, if issued in smaller and handier volumes (we can almost see the book-lover reaching for one of them with affection). May the present edition be to the next one as the 1543 Vesalius to the 1552-5 Vesalius, a collector's specimen, sought after for its historic associations, but yielding to its successor in completeness, usefulness and availability as a source of ready reference. As it stands, this volume ought to be in the hands of every seasoned lover of medical books and of every student who wishes access to the best bibliographic introduction to medical literature since Haller and Boerhaave. Those who work for the larger and more distant end will do so in the spirit which moved Sir William to put his remaining energies into the task and Lady Osler to carry on in the face of doubled loss—

"Make me see aright

How each hath back what he once stayed to weep,—
Homer his sight, David his little lad."

F. H. GARRISON.

SECOND ANNUAL GRADUATE FORTNIGHT

The Second Annual Graduate Fortnight of The New York Academy of Medicine will be held October 7th to 19th, 1929.

The subject chosen for this year's Fortnight is "Functional and Nervous Problems in Medicine and Surgery."

Afternoon Sessions in Teaching Hospitals

In the afternoons a number of the large hospitals of the city, with an abundance of clinical material, will cooperate in the Fortnight by presenting specially arranged clinical programs.

Attendance at the afternoon hospital clinics will be controlled by clinic tickets, for which advance registration is requested.

A registration blank for reservation of clinic tickets will be mailed upon request. Clinic tickets will be sent to those who make reservations, or may be called for at the Registration Bureau.

Evening Sessions at the Academy of Medicine

Evening sessions will be held at the Academy at which well known authorities will discuss many phases of the general subject. The evening meetings will begin promptly at 8:30. No tickets of admission will be required.

Additional Clinics

Besides the specially arranged hospital programs the regularly announced non-operative clinics and clinical conferences will be held as usual, both morning and afternoons during the Fortnight, in over forty teaching hospitals of the city. No registration or tickets will be required for these clinics.

The complete program has been mailed to registered physicians residing within a radius of one hundred miles of the city.

LIBRARY NOTES

A VOLUME ON DEPOSIT AND ITS OWNERS

Dr. Robert F. Loeb, a Fellow of the Academy, very kindly deposited a very valuable volume in the Library for safe keeping after our Harvey exhibition was over. It formerly belonged to his father, the late Professor Jacques Loeb, that distinguished physiologist, and contains the following books in the order given:

- 1) Christopher Jacob Trew, *Dissertatio Epistolica de Differentiis quibusdam inter Hominem natum et nascentem*...Norimbergae...MDCCXXXVI.
- 2) William Harvey, *Exercitationes de Generatione Animalium*...Londini...M.DC.LI.
- 3) William Harvey, *Exercitatio Anatomica de Motu Cordis*...Francofurti...M.DC.XX\ III.
- 4) Werner Rolfinch, ...*Dissertatio de Hepate*...Jenae...MDCLIII.

The books numbered (2) and (3) are of course first editions of Harvey's two famous works.

The volume is bound in vellum and on the spine is a paper label bearing the title, "Trew et Harvei de Generatione et moto sanguin," below which is written "Severino." The first blank leaf inside has an endorsement which is probably that of a bookseller: "L'opusculo di Arveo è annotato da Marco Aurelio Severino, raro e prezioso." And when we turn to (3), we find that beneath the date on the title-page is written: "Clarissimo viro Marco Aurelio Severino ab Illustrissimi Autore dono missus cum Libris," so the book was a gift from Harvey. There are many notes in the same hand throughout the book and another at the end that Severino had written the annotations in 1642. Marco Aurelio Severino (1580-1656), a native of Calabria, professed anatomy and surgery at Naples and is recognized as the author of the first book on comparative anatomy (*Zootomia Democritae*, Norimb., 1645) and by De Renzi as the regenerator of Italian surgery. Some of the books of Severino are in the Bibliotheca

Lancisiana at Rome.* It is also of some interest to note that Sir John Finch (1626-1682) and Sir Thomas Baines (1622-1680) together purchased part of the library of Severino in 1663 from the Secretary of the Kingdom of Naples.** Luckily enough Harvey's book was not in the collection, for the Finch and Baines library, together with a portrait of Mrs. Harvey with her parrot, were destroyed by fire at Burley-on-the-Hill, in Rutland, England, about 1906, despite the united efforts of the firemen and those of Winston Churchill who was staying in the house at the time. *Punch* took notice of the fact that Churchill had added to his collection of hats by borrowing a helmet on that occasion!

The most important point about this copy of the first edition of the *De Motu Cordis* is that it is a considerably larger copy than any other which the present writer and Mr. Geoffrey Keynes, the recent bibliographer and editor of Harvey, have seen. Most of the copies now extant have been much trimmed; for instance, that owned by the Academy, which came from the library of the late Dr. Walter B. James, measures $7\frac{1}{4} \times 5\frac{1}{2}$ " while the Loeb copy measures $8\frac{3}{8} \times 6\frac{3}{4}$ ". The copy now in the Bibliotheca Osleriana at McGill University, Montreal, is complementary to the Loeb one. What the Loeb copy lacks in height is supplied by Sir William Osler's copy and where the Osler page is narrow, the defect is made up by the Loeb one. The Osler copy measures $8\frac{1}{2} \times 6\frac{5}{16}$ ". Unfortunately, however, the paper of the Loeb copy is very poor in quality, is foxed and has become crumbly, but the James and Osler ones are printed on much better paper which has lasted well.

It is a thousand pities that Harvey's great book was so badly printed and many errors made their way into the text. I do not believe that the Frankfurt publisher, Wil-

* Information given in a letter to the writer from Dr. Pietro Capparoni of Rome.

** See *Finch and Baines, a Seventeenth Century Friendship*, by Archibald Malloch, Cambridge at the University Press, 1917, pp. 41 and 79.

helm Fitzer (an Englishman, by the way), was altogether to blame, for Harvey wrote a diabolically bad hand. Most of the copies of the book which are now to be seen have no leaf of errata; for example, there was none in three of the four copies shown at the recent Harvey exhibition at the Academy, but according to Mr. Geoffrey Keynes a minority have it. Happy we are to say that the page and one-third of errata is found in the Loeb copy.

The books we have numbered (1) and (2) in the volume have the name "Dr. Ruberti, Michelangiolo Alessandro" inscribed on their title-pages. Ruberti was a Neapolitan* and in 1745 described a double-headed calf. We have no copy of this publication but there is one in the British Museum: Ruberti (Michele Angiolo), *Lezione sulla testa mostruosa d'un Vitello*. Napoli, 1745, 4°. This book evidently called forth a good deal of discussion; whether it was all playful, or serious, or playful and at the same time serious, we cannot say. De Renzi notes one commentary and it is in the British Museum: Gulliver (Lemuel), *Lezione su d'un Vitello a due teste dell' Accademico delle Scienze, colle note di L.G.* [Naples? 1745?], 4°. The *British Museum Catalogue of Printed Books* states that this is a satire upon the *Lezione* of Ruberti. It is amusing to speculate about "Lemuel Gulliver" and who he could have been. Of course one would think immediately of Jonathan Swift, but he died in 1745, the very year in which Ruberti's publication appeared. Besides, some years before his death he began to show the change which he had prophesied to Young: 'I shall be like that tree: I shall die at the top.' There is one medical pamphlet in the Academy entitled *The Anatomist dissected: or the man midwife finely brought to bed... Touching the late pretended Rabbit-bearer*, 3rd ed. Westminster, 1727, written by 'Lemuel Gulliver, Surgeon and Anatomist to the Kings of Lilliput and Blefuscu...' but this is no longer attributed to Swift, though the Dean was interested in medical matters and wrote *The Right of Precedence between Phisicians and*

* Salvatore De Renzi, *Storia della Medicina in Italia*, 1845-1849, v, 320.

Civilians enquir'd into, Dublin, 1720 and *A Serious and Useful Scheme to make an Hospital for Incurables of universal benefit to all His Subjects*, London, 1733.

John Arbuthnot, the medical poet and friend of Swift, Pope and Gay, used 'Lemuel Gulliver' as a pseudonym when he wrote *The Masquerade. A Poem*. He added that he was the "Poet Laureat to the King of Lilliput." This is contained in *Miscellaneous Works of the Late Dr. Arbuthnot*, Glasgow, 1751, of which the Academy has a copy. Unfortunately, as he died in 1735, we cannot assume that Arbuthnot was the author of the notes on Ruberti's work. The question of the identity of our 'Lemuel Gulliver' is really a Brobdingnagian one and we must leave it unanswered.

Another commentary upon Ruberti is to be found in the British Museum. Its title suggests that the author must have found amusement in writing, and his friends in reading it. The author was 'Lisandro' and the playful work, *Dialogo interlocutori, Lisandro Aristide e D. Fastidio*, [Naples? 1745?]. The literary world must have thanked that cow for giving birth to a two-headed calf!

The four works contained in this precious volume could not have been bound together in the lifetime of Severino for (1) was not published until 1736 and Severino died in 1656. It is possible that Ruberti had it done or at any rate the whole volume would seem to have been in his possession as notes on one of the blank end leaves, added at the time of binding, are evidently in the same hand as that of Ruberti's signatures. It is impossible at the present time to answer all the questions called forth by this volume. There are notes in two hands in (2) resembling those of Severino and Ruberti. It seems likely that the armorial stamp in (2) and (3) is that of Severino but one cannot be certain as it remains unidentified.

Dr. Robert Loeb has set a good example in placing a valuable and notable volume in our care. Who will follow his lead?

ARCHIBALD MALLOCH.

AMONG OUR MANUSCRIPTS

A collection of medical documents often yields material of unusual human and historical interest. The dingiest scrap of paper may prove to be of value in connection with some great personage of a century or so ago, and some new and startling biographical fact may be hidden away on a worn yellow sheet. The manuscripts in this library offer ample reward to those who feel a desire to turn their thoughts to the past and ponder over the lives of the founders of this Academy and their immediate forefathers.

A well-known figure in Colonial politics was Thomas McKean of Delaware and Pennsylvania. Claimed by both of these states, he was the only member of the Continental Congress that served from its opening until peace was established, and his name will always be remembered as one of that noted group who signed the Declaration of Independence. It was indeed a surprise to come across his signature twice in our collection of medical manuscripts. The first is on a single sheet of paper, well worn by its contact with many hands. It is dated December 12, 1799, and addressed to one of our first great statesmen, Alexander Hamilton. The note recommends to Hamilton a young doctor, "a gentleman of general science and of an amiable character" who intends to "follow his profession of Physic in your city." Hamilton had resigned from the Cabinet and was then practising law in New York. The "gentleman" it seems, was Dr. John Richardson Bayard Rodgers, a distinguished member of a very prominent family. He had been a surgeon in the Revolutionary Army and had served on Washington's Staff. His father was the Reverend John Rodgers, chaplain of the New York Provincial Congress and first Vice Chancellor of New York State University. His son was Dr. John Kearny Rodgers, also a famous New York surgeon, who became Vice President of this Academy in 1848. Few families can boast such a record for three generations, and McKean with confidence assures Hamilton that Dr. Rodgers "is

esteemed skilful therein, [the medical profession] by the most eminent in that Sine of this place."

McKean's connection with the world of medicine seems to have been confined to some extent to penning lines of approbation, for a few years later, on April 27, 1805, still in his capacity of Governor, he signed an official recommendation of another doctor, also a resident of Philadelphia, Dr. Felix Pascalis. The library is rich in material concerning this gentleman. Diplomas of societies here and in France, letters to and from physicians of many countries, indicate his position in the medical world of his time. It was in this year, 1805, that the fever epidemic of Cadiz raged, and Dr. Pascalis left this country for Cadiz and Gibraltar to study the disease. It was extremely difficult to enter Spain during that period and he was forced to go by way of France. It took him many months to reach his destination, for we find also among our papers a passport allowing him to enter Cadiz, October 16, 1805. This document was first issued, April 27, 1805, by Don Carlos Martinez de Yrujo, Ambassador from the Court of Spain to the United States of America. From his hands it passed to those of Ortiz de Rozart, official at Bonanza, Mexico, June 26, 1805, and hence to Lucar de Barrain at Cadiz.

It is gratifying to see Thomas McKean writing in recommendation of Dr. Pascalis, as we find in much of his correspondence a note of bitterness that after years of service for this country he was still treated as a foreigner and refused appointments because of his birth in another land. McKean writes in his own hand: "I do hereby recommend the said Felix Pascalis to the protection and favorable attention of all officers, civil, naval & military of the said United States, and of those nations in alliance or amity with the United States of America, and all others; and to afford him all the aid he may stand in need of on his voyage to France, and on his return to the said United States." His stay abroad could not have been long. On his return to this country he took up the practice of his

profession in this city, where he remained until his death in 1840. In November, 1813, he wrote to his wife, who was living in New Jersey on account of financial difficulties: "As for my part after 13 years experience in Philadelphia & 8 yrs. in New York I am convinced that my practice should no more be depended upon as our sole support." He complains of this in many of his letters. Fortunately this was not common among successful and esteemed physicians of the time, or many talented young men would have been easily persuaded to forsake a career of medicine and turn to something more lucrative.

It is in the contents of these long forgotten papers that we discover the part played by medical men in the young days of our country. It seems well worth the while of the student of medical history and biography to spend a few spare moments with these intimate and personal records that link us with the past.

GERTRUDE L. ANNAN.

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CORRECTION

In the August number of the Bulletin (Vol. V., No. 8) two errors appeared in the obituary of Dr. Reginald Hall Sayre, which are corrected to read as follows:

Page 809, second paragraph, second line "... Hospital and President in 1909-10 [not 1902-10]."

Page 811, fourth line, the date of Dr. Sayre's death is May 29, 1929 [not 1919].

MEMORIAL ADDRESSES

HIDEYO NOGUCHI

1876-1928

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By those who knew Hideyo Noguchi he will not be forgotten. His kindly, cheerful disposition, his loyal friendship, his warm, affectionate personality, and his modesty have endeared him to his associates. His place in medical and world history, however, will be determined by the products of his labors after his personal friends shall have followed him.

The formidable scientific output of the present generation, with a promise of still greater productivity of the next, will make many achievements of the immediate past seem commonplace; and the silence of comparative oblivion will descend and envelop even those who have in a conspicuous manner served humanity. In science, so interlocking have become the items making for some outstanding discovery that in the future it may be desirable to raise a monument to the unknown scientist who was the first proponent and inciter of some specially noteworthy advance.

There appear, however, at rare intervals men whose originality and whose capacity to bring that originality to actual fruition are so manifest that with little or no dissent their colleagues and co-workers are prepared to lift them well above the common level. Such a figure was Hideyo Noguchi. The achievements of such men grow as they recede from us in time instead of gradually merging into the commonplace.

In the conduct of scientific research we may postulate three main concepts: the guiding idea or forecast, the method or technique, and the result or outcome. The world

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at large cares only for the outcome. To the scientist, the other items are of supreme importance. If the forecast is well considered, even a faulty method may carry the worker to success. With a superior technique, he may obtain results by boring in many directions without any guiding plan. It may happen that the idea does not guide, the method may not work, but even then an accident may bring results. This is frequently the common lot.

It is too early to attempt an analysis of the forces which led Noguchi to so many successes, but we may at least glimpse what the coming years will see more clearly. Underlying the idea leading up to the solution of some special problem is what may be called the moral ideal governing our activities, what it is all about, why we spend so much life energy in any given direction. Reading between the lines of Noguchi's protocols we may see a guiding ideal throughout, to do something useful for humanity in the struggle against disease and to do it as promptly as possible even by abandoning, at least temporarily, more interesting and stimulating paths. All his labors tend towards some practical end.

In this and in the more definite ideas and forecasts governing the choice of problems, we feel the dominating influence of his teacher, Simon Flexner. It is he who worked with him and for him; who recognized the special capacities of his ward and directed him towards the tasks which he so successfully carried out; who advised, encouraged, stimulated and repressed: for the dangers that surround the brilliant worker in letting his mind outrun his slower and more or less tedious physical progress are great, and, unless controlled, they not infrequently lead to sterility. Noguchi had another great advantage, without which even the best minds may remain unfruitful, namely material equipment. He was fortunate in having behind him the resources of the Rockefeller Institute for Medical Research. The internal evidence to be gathered from his published work is clear as to the exotic requirements of much of his work.

In technique Noguchi was master in many fields, but he especially excelled in creating his own methods. These were relatively simple, but his craftsmanship was such that he accomplished wonders with them. In biology, where so many unknown factors are involved in any problem, only close personal application and the modification of methods to suit the new and often unexpected situations that present themselves will eventually succeed.

The most impressive thing in Noguchi's scientific career was his marvelous industry. All of his numerous papers present the internal evidence of laborious, time-consuming processes, carefully controlled. Nowhere is there any indication of any devices automatically yielding results. His expeditions into the many fields of medical science were personally conducted and largely alone. His method appears to have been to make himself at the start master of all the work of his predecessors and of the current technique,—to which he always added original touches if not wholly new devices. He was scrupulously careful in giving due credit to earlier investigators; and he was seriously distressed to discover any lapses due to the difficulties of tracing unindexed results in old and new writings. He never appears to have gotten lost in his methods or to have permitted them to dominate him. He turned with facility, without a break, from one technique to another entirely different.

Noguchi's career in medical research may be divided into periods according to certain major problems. From about 1900 to 1908, he was absorbed in the study of snake venoms and a number of collateral problems in immunology. In the next period, to 1918, his work was chiefly upon syphilis and during this period he became interested in many other forms of spirochetes. In his last period, his major work was the bringing to light of etiological factors in yellow fever, Oroya fever, and trachoma. During the second and third periods he did not lose sight of his earlier work, and throughout this part of his career, medical literature contains papers on a variety of sub-

jects outside the domain of his major problems and harking back to his earlier preoccupations. These multitudinous interests were due in large part to his skilful technique which enabled him to bore successfully into more or less alien fields, among them, for example, protozoology, in which even the masters were marking time.

At the beginning of his career he came into the field of pathology just as it was entering the new era of quantitative rather than qualitative experimental procedures. The discovery of toxins and antitoxins and the fairly accurate measurements of toxic and antitoxic energy during the last decade of the nineteenth century enabled him to apply them to his own particular tasks. In his many publications of this period he has always added something to the stock of demonstrable facts. A few details concerning these three periods will not be out of place on this occasion.

During the years from 1900-1907 he was busy with problems relating to the hemolysins and agglutinins of snake venom and the protective sera. He was also drawn into the study of chemically known substances acting as hemolytic agents. During most of his subsequent career he continued to dip into the Pandora's box of medical mysteries—the blood—for both problems and their solution. I believe it was Goethe who characterized the blood as "Ein ganz besonderer Saft," and Noguchi's life work has materially added to the existing evidence that it holds at least a part of the secret of all our problems. Towards the end of this early period he edited in book form his researches together with much information on the anatomy of snakes and the physical and chemical characters of the venoms. If he had stopped here, this large volume in itself would have established his reputation as a keen observer and experimenter and as one endowed with a breadth of view which regarded nothing short of the whole as his final objective.

Towards the end of the first decade he began his work on the many aspects of syphilis, which perhaps will leave

the most permanent record of his life work. At the beginning of this epoch, Schaudinn had already demonstrated spirochetes in the lesions of syphilis. Noguchi soon succeeded in obtaining pure cultures of the *Treponema*, with a craftsmanship applied to his special culture medium which few could follow. His demonstration of *Treponema* in the cerebral cortex of general paralysis and in tabes cleared once for all the diagnostic difficulties which surrounded these clinical entities. He developed a special diagnostic technique and defended its place beside the current methods with a great statistical array of actual tests. He did not stop with *Treponema* but continued to apply his technique to the pure culture of many spirochetes on the mucous membranes, and in external nature, which we had hopelessly seen flit across the fields of our microscopes from time to time.

We need only to mention here his cultivation of the globose bodies in infantile paralysis and his important work in the development of a vaccine virus free from the miscellaneous bacteria of the bovine product. Much of his work of this and other periods will be taken up again and form the groundwork of further structures when our present anxiety to bring forth absolutely new scientific products will have subsided somewhat in favor of a more orderly development of the new territories discovered since the time of Pasteur.

In 1918, Noguchi began a series of researches on the etiology of obscure infectious diseases which was to continue until his death. In this, perhaps the most difficult field, his success was equal to that of his earlier demonstrations to reach the goal at which he aimed.

Infectious diseases of more or less identical clinical expressions so far as they are now understood, may have a bewildering array of different causes. Hence when a disease of unknown etiology presents itself, the cause may logically be referred to a variety of mechanisms. To pursue an inquiry into these requires a different preparation and a different procedure for every one of them. Which

of the latter is to be followed is naturally a matter of grave concern to the investigator and may mean success or failure. Moreover, there may be several living agents involved, working in series or together, both of which may be necessary, or one dominant. The incidence of disease may be seriously modified or obscured by longstanding endemic resistance, and its clinical nature so misread that it is regarded as of sporadic and relatively harmless character. In addition to these difficulties the discouragement which is associated with the many failures of earlier attempts by other skilful investigators must be overcome and be replaced by optimism and enthusiasm.

Of the three diseases studied by Noguchi during this last period yellow fever is undoubtedly the most formidable enemy of the race. In view of recent investigations on the African continent which thus far fail to substantiate Noguchi's results on the American continent, I have read again the papers on his yellow fever studies in South America. I do not see how anyone could have drawn inferences other than he did. He was at the time well versed in the work of his countrymen on the spirochetes of Weil's disease, which might have been confounded with it, having himself already added to current knowledge of this clinical entity. It remains for the future to inform us, whether a distinct clinical yellow fever complex exists which is due to spirochetes, or whether the South American type of yellow fever is so mild that it needs the co-operation of an endemic spirochete disease to make it effective. Such geographical alliances among microbes are not unknown and they form most interesting, albeit highly controversial chapters in etiological research, besides leading to the temporary rejection of valuable work. I may say in passing that it is not impossible that the future may unsettle many a well established cause of disease by unearthing some cooperating underlying invisible agencies. The most certain demonstration of the actual character of South American yellow fever would be found if this yellow fever should escape from the endemic territories in epidemic form, for it is often only in such escapes that

disease becomes primitive, exposes its original etiological foundation, and unfolds its most dangerous characteristics. I am convinced, however, that humanity is willing to wait for a more conservative and less cruel, even if more tardy, disclosure of the actual nature of this dread disease.

Noguchi's recent work on the Oroya fever of the Peruvian Andes brings out in clear detail, the existence of two widely differing clinical types of disease due to the same organism, a general febrile disease on the one hand, and a local process on the other. The work has been particularly instructive in bringing to the surface through Noguchi's culture methods a bacterium of peculiar habits and characters which, imitating the habits of a non-cultivable parasite of the red blood corpuscles, would lead most investigators astray. The most recent work on this disease, which completes the cycle of the microbe through the body of a biting insect, would have been extremely satisfactory to Noguchi had he lived to learn of it.

Noguchi's final work on trachoma is a striking demonstration of his capacity to dig down into the debris of earlier failures and bring success to the surface. He procured an organism with which he has produced in certain animal species a local disease indistinguishable from the human malady. In a superficial process of this kind, the investigator has to contend with a variety of more or less accidental parasites, often replacing or crowding out the earliest inciting factor, the detection of which however is essential to the final solution of the problem of causation. He had not lost any of the persistence and untiring industry shown in earlier work, for he eliminated one after another the many types of bacteria which lived in or on the trachomatous conjunctiva until one was found which produced characteristic lesions in certain monkeys. Even this one might have been passed by as of no special significance by most observers.

This very brief, hurried and imperfect glimpse of Noguchi's scientific activities, involving as it does the omis-

clinical traditions, occurring in epidemics diagnosed as yellow fever. It is of the utmost importance also to know whether the leptospira is a secondary invader in yellow fever. Nor were Noguchi's studies limited solely to the spirochete. I would simply like to emphasize on this occasion that, whatever the issue as to the relationship of the spirochete to yellow fever, Noguchi's work constitutes a very important contribution to the subject.

Memorial meetings such as this are perhaps of more benefit to those who participate than to the one commemorated. Noguchi's fame is secure. He stands now and did stand at the time of his tragic death among the foremost international figures in experimental medicine and biological science. But we do well to come together and to pay our tribute of respect and admiration and affection to the memory of such a man as this. We do well to cherish his memory, to perpetuate his name; and we should do better if we were inspired by his example, his singleminded devotion in the search for truth, his loyalty, and his desire to extend the boundaries of knowledge for the welfare of mankind.

DEATHS OF FELLOWS OF THE ACADEMY

JAMES DITMARS VOORHEES, B.A., M.A., M.D., Easthampton, L. I.; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1893; elected a Fellow of the Academy, March 6, 1902; died, July 30, 1929. Dr. Voorhees was a Fellow of the American College of Surgeons, a member of the Obstetrical Society, a member of the Society of Alumni of Sloane Hospital for Women and of the Alumni of Presbyterian Hospital. He was Consulting Obstetrician to the Greenwich General and the Southampton Hospitals.

JOHN HENRY GUNTZER, M.D., 51 North Regent Street, Port Chester, N. Y.; graduated in medicine from Bellevue Hospital Medical College, New York City, in 1889; elected a Fellow of the Academy, December 3, 1908; died, August 5, 1929. Dr. Guntzer was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, and a member of the American Laryngological, Rhinological and Otological Association. He was Assistant Surgeon to the Manhattan Eye, Ear and Throat Infirmary, and Otologist and Larynologist to the United Hospital.

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THE HISTORY OF DRAINAGE, IRRIGATION, SEWAGE-DISPOSAL AND WATER-SUPPLY

Visitors to Washington will recall Potomac Park and the attractive one-way speedway which encircles Hains Point, a peninsula of made ground over what was once the great eyesore of the District of Columbia, that festering stretch of slimy marsh and bristling cat-tails known as the Potomac Flats. The reclamation of this haunt of frogs and mosquitoes by Army engineers, backed by Congressional appropriations, was carried on at a tempo incredibly slow—in my recollection it was going on all through my boyhood and long thereafter—but it proved to be one of the most important feats of sanitary engineering executed on this continent, albeit with no specific hygienic intention at the start. For, when the late Dr. A. F. A. King propounded his hypothesis of mosquito-transmission of malarial fever to the Washington Academy of Sciences in 1882, with the recommendation that the city be invested with a colossal woven-wire screen as high as the Washington Monument, he was greeted with loud-resounding Homeric laughter, as a genial purveyor of harmless, humorous paradox. Washington, the sleepy Southern town where political history has been so unobtrusively made that Maximilian Harden murmured "*davon kann man träumen*," the "city of beautiful distances" which will some day be an object lesson to the world in town-planning, was once the "Swamp-poodle" of Mrs. Trollope, Dickens and its even more satirical inhabitants. In the area from the Potomac waterside to Mount Pleasant Heights, the fair city has, even to this day, some

of the climatic traits of an ex-malarial swamp.¹ Small fortunes were made, just after the Civil War, by judicious real-estate investments in mud-puddles, over which most of the residential and business sections of the city were ultimately built. The reclamation of land for parking in the immense area back of the White House, extending far down the Potomac, was, as stated, not primarily done for sanitary reasons, but as part of the Olmsted program of beautifying Washington by way of landscape gardening. In the light of what is known of Greece and Italy as malaria-infested states, let us imagine the possible fate of the National Capitol, now our tenth city in population, if the chances of convection of malaria, were overwhelmingly increased (as in Ronald Ross's calculations) by increased chances of mosquito-breeding. Even through the eighties and the nineties, malaria was rife in the District of Columbia, so much so that women and children were always taking quinine, like the unfortunate people on the banks of the Mississippi, in the illustrations of Mrs. Trollope's book. "Chills and fever" in fact, had much to do with the poor health and sorry physical appearance of Americans all through these earlier days. Since our participation in the World War, Washington has doubled its population up to half a million inhabitants, and the influx of new people, attracted by political motives, chances for social pleasuring and increased opportunities for big business, is still large. It is only in the last few years that the city has been built up to its present expanded population, as suggested by the long, funereal rows of motor-cars which line every available street. There are still some mosquitoes, and, with the history of Camp Wheeler in mind, no one would dream of claiming a rigid causal-nexus between swamps and malaria. As in the earlier cases of Greece and Rome, there could be no malaria, even in a mosquito-ridden population, without the presence or

¹ Colonel Repington observed that the city is "as hot as Cawnpore" in September. The enervating quality of the climate, with its sudden changes, is a matter of common observation among Army people and their families, fresh from the tropics.

introduction of human carriers. The independent variables are the number of susceptibles, the number of *Anopheles* on hand and the chances of increased mosquito-breeding; the efficient cause is the existence of the disease in the community or its introduction from without. In old Washington, as in Mauritius before 1866, thousands of people were bitten by non-malaria-bearing *Anopheles* and remained uninfected, but the chances of infection were continually increased by the number of potential carriers (infected patients and *Anopheles*) on hand. As the city, *viâ* Congressional representation, is made up of people from every state in the Union, new carriers were ever coming in to take government positions or to follow other employments. The city of Manila is still infested with dengue but is now absolutely free from malaria, because there are no human carriers in the community; but a marching command, sent on an ordnance survey from Fort McKinley, into Batangas, brought the disease into the post upon its return, although the carriers were apparently immune in the hinterland, through routine administration of quinine on the march. After the Russian Revolution and famine, malaria was carried (and still exists) as far north as Archangel, in the Arctic Circle.

The history of the reclamation of Potomac Park and Hains Point is the history of all earlier achievements in sanitation *viâ* drainage, *i.e.*, the attainment of a sanitary end without definite sanitary intention. The classical instance is that of Empedocles, who improved the health of Selinus by reclaiming the swamp land thereabouts and the climate and harvests of Agrigentum by blocking a windy rift in a hill.¹ The primary motive in either case was not sanitary but economic, concerning the livelihood and creature-comforts of the inhabitants. The proof of the pudding is the decline of the mosquito-borne fevers wherever urbanization implies drainage, as in Sierra Leone, Lagos, Ismailia, Port Said, Cairo, Khartoum, Havana, Panama, Guayaquil, the Southern states, the Malay States.

¹ Diogenes Laertius, VIII, 51-77.

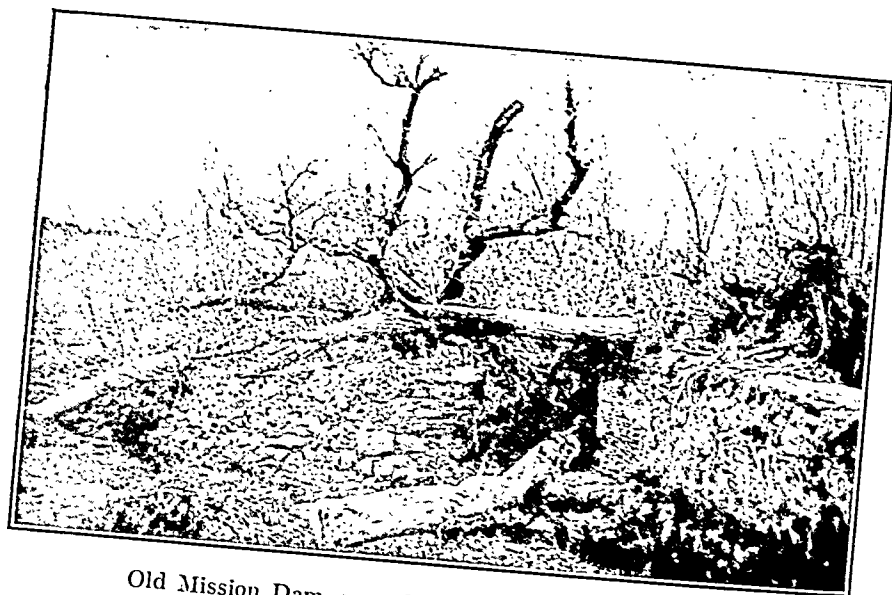
or the extensive operations now going on in Italy and Greece. In many cases, *e.g.*, in Camp Travis (San Antonio) or the areas around Fort Santiago (Manila), the exasperating bite of *Culex*, *Aedes* or *Anopheles* is usually a sufficient motive for the usual means of mosquito-reduction, *viz.*, choking the course of small streams, filling up pools and puddles, caulking holes and hollows in trees and general oiling of surface waters. To the wary and well-instructed, the annoyance of the bite connotes the possibility of infection. The history of drainage and the filling-in of swamp areas as sanitary measures for the upbuilding of cities is the history of every village, town or large city which has been accidentally or intentionally rendered healthful by devices centering on the economics of carrying on the world's business "as usual," with an eye to pleasurable living and creature comforts. As being of world-wide extent and duration, its interest is geographic rather than historic, more a matter of space than of time. Recital of dates, in connection with facts, would make a meaningless chronology, with an occasional "high-spot," illustrating the general trend of what Sudhoff calls immanent or intuitive sanitation.

There is scarcely an object or structure in any building, area or street which is not somehow related to the vast science of public, domestic, industrial and individual hygiene. Irrigation deserves our attention as basic in all large scale developments of the world's food-supply. The impounding of great bodies of water often subserves, in fact, the triple purpose of food-supply, water-supply and industrial water-power. Herodotus (II, 149) relates that Lake Moeris, in the Fayûm, was filled, as the Nile flooded, and drawn upon, for irrigation purposes, as the river subsided, a kind of precursor of the Assuan and Sennar irrigation dams. The most astounding developments in the past were those of Ceylon and India, where tanks of gigantic length and area were constructed, by means of earthen dams, for agricultural irrigation.

The oldest of the Ceylonese tanks, near Anuradhapura, was opened by King Panduwaasa, the successor of Vijaya, about 504 B. C. The Giant's Tank (Kattucarré) covered an area nearly equal to that of Lake Geneva (223 square miles), with a retaining bund over 15 miles long and 300 feet broad at the base. Its bed is now the site of populous villages. The Kalaweva Tank (459 A. D.) was 40 miles in circumference, with an earthen dam over 12 miles long and a stone spillway, described by Tennent as "one of the most stupendous monuments of misapplied human labor on the island." The Padavil-Colon tank was 12-14 miles wide, with a dam 11 miles long, over 70 feet high and expanding from 30 feet broad (top) to 200 feet at the base, constructed of hewn stones 6-12 feet long, many of them sculptured with elephant's heads and other devices. Tennent estimates that it cost about £1,300,000, enough to build an English railway 120 miles long, occupying 10,000 men over 5 years. In the Madras Presidency, there were over 53,000 such tanks (43,000 in repair in 1900), each with a dam half a mile long, or 30,000 miles of embankment in all, enough to encircle the globe with a girdle 6 feet thick, apart from 300,000 separate masonry sluices and weirs. The revenue in 1900 was about £1,500,000 sterling. The Ponairy tank at Trichinopoly was 60-80 square miles in area, with a dam 30 miles in length. There are 37,000 irrigation tanks in the Mysore District alone, and 2065 had been constructed under British rule in the Mairwara District since 1854. The Persian reservoir of Koh-rud (Ispahan), the artificial lake of Ajmeer or the Hyder tank (Mysore) are of relatively smaller dimensions. Notable here are the irrigation canals constructed under British rule in the Punjab and the Sind, and the Nadrai Aqueduct, 564 miles long (1881-9), with its great aqueduct bridge (1310 feet), spanning the Ganges with 15 arches, the largest in the world.

Comparable with these ancient barrages of Ceylon, in ingenuity and boldness of design if not in extent, are some of the mighty dams of recent years. The earliest of these, after Oriental antiquity, were erected by the Spaniards, who have always been substantial engineers.

The oldest existing dam in Europe is the Almanza in the province of Albacete (erected prior to 1586), which is 67.8 feet high. The Alicante (1579-94), erected in a narrow gorge of the Monegre River by Herreras, the architect of the Escorial, is the highest in Spain (134.5 feet). The Puentes (1785-91), on the Guadalantín River, destroyed by a flood in 1802, was 164 feet high. The Val del Infierno (1785-91), 116.5 feet high, on the same stream, is now filled with sediment. The Villar Dam (1870-78), on the Río Lozoya, was constructed by the Spanish government to supplement the water-supply of Madrid by storage. The oldest masonry dams in the United States were erected by the Jesuit Mission Fathers, namely the Old Mission Dam (1770) across the San Diego River and the El Molino, East of Los Angeles erected for the Mission San Gabriel a



Old Mission Dam, near San Diego, California (1770)

few years later. The Zola Dam (1843), affording a reservoir for the water-supply of Aix, was designed by the father of the famous novelist. The Furens (1862-6), regarded as a model of correct construction, was erected by the French government to protect St. Etienne from inundation, while the Pas du Riot (1872-8) formed a reservoir for the city supply. The Bousey Dam, near Epinal (1878-81), slid on its foundations (1884) and in spite of subsequent repairs (1889), actually turned turtle on April 27, 1895, with the loss of 150 lives. The highest in France, the arched dam projected over the narrow gorge of the Drac at Sautet, will attain to 444 feet. The Gileppe (1870-75), the most imposing in Belgium, is 154 feet high, 216.5 feet broad at the base and curves up stream on a radius of 1640 feet. The Vyrnwy Dam (1882-9), impounding waters in the mountains of Wales for the Liverpool supply, rises 161 feet from the base (117.75) and has a top length of 1172 feet. In the early nineties, the Bear Valley Dam (1183-4), on the Santa Ana River, California, which curves upstream with a radius of 335 feet, was accounted the "eighth wonder of the world" by reason of the tremendous pressure withstood for 15 years by a shell of such slender dimensions (64'x3-13'); while the San Mateo (1887-8) was then regarded as one of the largest in the world (170'x25-176'x680'). The Tansa (1886-91), forming a reservoir of 5120 acres for the Bombay supply, is 118 feet high and 8800 feet long. The Krishnaraja is said to be 124'x8600'. The Assuan, completed December 10, 1902, and irrigating some 2500 square miles of the Nile Valley, is nearly 1¼ mile (6400 feet) long and 113 feet high, while the Sennar (1926) on the Blue Nile, near Makwar, is 9925 feet long and 130 feet high. Imposing in height and length are

the great dams impounding the Croton and Catskill supplies of New York City, viz., the Croton Lake, 1913 (297'x2168'), the Ashokan, 1915 (252'x4650'), the Kensico, 1917 (307'x182') and the Schoharie, 1923 (182'x2000'). But it is with the growth of hydroelectric engineering that the greater American dams for irrigation and industrial water-power came into being. It is said that some two-thirds of the water-power now in use in the world has been developed since 1910. About this time arose the Shoshone (1910) in Wyoming (328'x200'), the Roosevelt (1911) on Salt River, Arizona (280'x1080'), the Keokuk (1913) on the Mississippi (53'x4360'), to be followed by the Arrow Rock (1915) in Idaho (349'x1100'), the Elephant Butte (1916) in New Mexico (306'x1674'), the Pathfinder (1922) in Wyoming (218'x432'), the Don Pedro (1923) on the Tuolumne River, California (288'x1010'), the Tieton (1925) on the Yakima River (222'x905'), the Mormon Flat (1925) on Salt River, Arizona (225'x661'), the Exchequer (1926) in California (333'x930'), the Horse Mesa (1927) on Salt River, Arizona (311'x761') and the Wilson (Muscle Shoals) on the Tennessee River (112'x1500'). Among those projected by the Bureau of Reclamations are the Gibson in Montana (195'x960'), the Owyhee in Oregon (105'x810') and the Boulder Dam, approved by the President, June 25, 1929, for impounding the surplus flood water of the Colorado River. The O'Shaughnessy Dam in the Yosemite Valley, California (1929) will ultimately attain to 312'x900'. In height and extent, many of these great structures are awe-inspiring.

Drainage with sanitary intention could not acquire a scientific status until the significance of such discoveries as the malarial plasmodium (Laveran, 1880) the typhoid bacillus (Eberth, 1880), or the cholera bacillus (Koch, 1883) had been well understood. Irrigation, for agricultural purposes, while a phase of food and soil economy, concerns the physician and the sanitarian less than the engineer. When we come to the disposition of excreta, offal and street wastes, we are upon a more difficult terrain.

In the literature of classical antiquity, facetious references to the normal physiological functions, indicated in English vernacular by "smutty words of four letters each," are plentiful enough; but *faeces*, *faeces* (drogs, sediment, impurity) are never used in the sense of *excrementum*, the ordinary Roman term (so common in Kühn's *Galen*), nor are they discoverable in the mediæval Latinity of DuCange. *Urina* is common enough, as also *latrina*, with which ex-

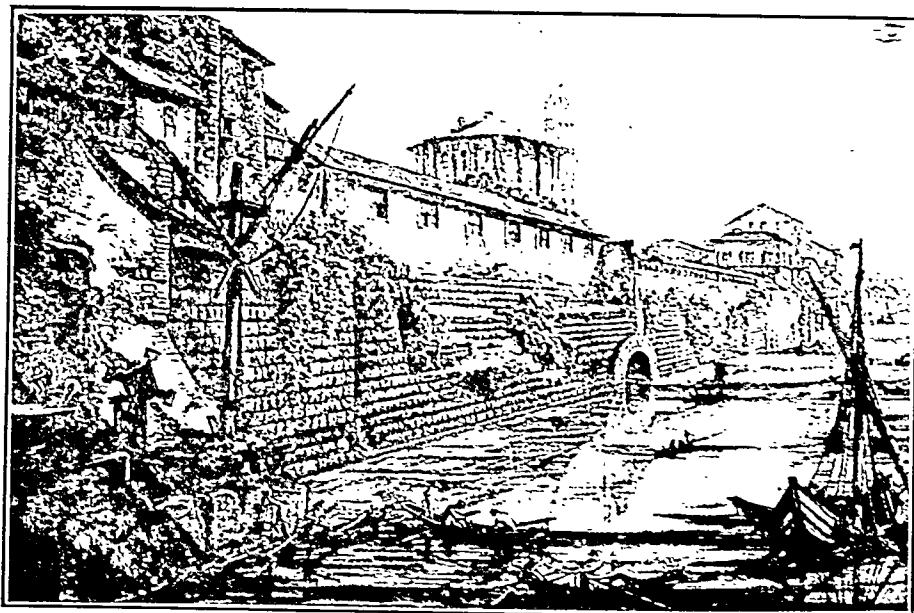
well-appointed Roman house of the better classes was eventually provided; but while urination is occasionally depicted on Greek vases, references to the excreta are conspicuous by their absence in the plays, poems and other secular writings of the Greeks and Romans, even from those of intentionally indelicate character. In keeping with this instinctive cleanliness of thought and deed, foot-baths, shower-baths and wash-stands of modern lavatory type were as common to the Greeks as were water-closets and urinals to the Romans. Water-closets of modern pattern have been excavated at Babylon, Nineveh, Knossos (Crete), Tel-el-Amarna (1400 B. C.), Cairo (640 B. C.), Priene and Pompeii. The *Gesolei* at Düsseldorf (1926), exhibited models of multiple arrangements from Puteoli (45 seats in rectangular formation), the bath-rooms of the Roman military station at Timgad (28 seats in ring formation) and the palace of Augustus Caesar at Rome (3 seats). By contrast with the irresponsible shiftlessness of primitive nomadic man in this regard, Greece and Rome possessed, in fact, the essential elements of a "public comfort room," albeit dispersed in space and time. An Athenian ordinance of 320 B. C. inflicts punishment upon any one apprehended for casting offal in the streets. Every well appointed house in Rome had *latrinae* near the kitchen and it was in the *latrinae* of his palace (according to Lampridius) that the Emperor Heliogabalus met his end. Disposal of excreta from the gigantic tenement-flats (*insulae*) of later Rome was, in all probability, effected by piping into the Cloaca Maxima. This device of water-carriage of sewage seems to have occurred to primitive man at a very early period, as an evolution from the ordinary open street-gutter and was obviously an improvement upon exposure to the air, covering with earth, incineration or storage in receptacles. Savages in the hinterland of the Philippines evacuate their excreta into flowing streams, a trait anathema to the ancient Persian, who tabooed urination into rivers and still disposes of his dead by exposure on high

towers,² lest the corpses pollute the four sacred elements, earth, water, air and fire. The Egyptian trait of storage was discovered in Manila by an Army file of my acquaintance in the guise of four tall columns of obelisk type, surrounding a fine Spanish mansion he had rented and containing the accumulated human filth of many decades. Here, the remark of the Indian chief about the U. S. Army latrine will bear repetition: "White man must think a lot of filth to build a house around it." One of the horrors of Naples, in fairly recent years, was the frank deposition of excreta near the sidewalk, to be collected every morning by a sort of *vidangeur*, equipped with an ordinary garden hoe and a pannier attached to his back. In striking contrast, are the wonderful Assyro-Babylonian drains, piping sewage from Assur (the oldest city of Assyria) and Babylon, from the temple of Baal at Nippur (2000-1000 B. C.), from the palaces of Tikulti-Ninib (1250 B. C.), of Sargon at Chorsabad (800 B. C.) and of Nimrod at Nineveh (800 B. C.); the Egyptian systems of copper piping of sewage from the great pyramids and temples; the jointed cannon-shaped terra cotta sewer-pipes of the Cretan Palaces at Knossos (3500 B. C.) and Tiryns (1450-1250 B. C.).

Construction of the Cloaca Maxima in Rome (Livy, I, 56) was begun by Tarquinius Priscus (616-578 B. C.), primarily as an underground drain to lower the groundwater level. Only later was it used as a system of conduits for removal of excretal wastes, as the city expanded in size and population, in connection with which, its first

² Captain Theodore Bitterman, U. S. Army (Ret.), who visited two Towers of Silence in Bombay in 1924, states that the Parsee (Persian) dead from India are sent to them for disposal. The venerable trees about the twin Towers swarm with patient vultures, greedy to get at their work of scavenging the polluted human flesh. Directly a naked corpse is exposed on the Tower by the Parsee priests, who lift the cloth which covers it, the whirl of mighty wings resounds and the dead body is stripped to the bone in a few minutes. The dried skeleton (regarded as clean) is then dropped through a grating into the deep dust at the bottom of the Tower and eventually decomposes. Over a long period of time, the depths, as computed by British officials, have remained nearly constant.

cleansing occurred under the ædileship of Marcus Agrippa (33 B. C.). This great seven-fold system is described by Pliny (xxxvi, 24) as follows:



Cloaca Maxima, Rome. (Etching by Piranesi)

"For this purpose. there are seven rivers made by artificial channels, to flow beneath the city. Rushing onward, like so many impetuous torrents, they are compelled to carry off and sweep away all the sewerage; and swollen as they are by the vast accession of the pluvial waters, they reverberate against the sides and bottom of their channels. Occasionally, too, the Tiber, over-flowing, is thrown backward in its course, and discharges itself by these outlets: obstinate is the contest that ensues within between the meeting tides, but so firm and solid is the masonry, that it is enabled to offer an effectual resistance. Enormous as are the accumulations that are carried along above, the work of the channels never gives way. Houses falling spontaneously to ruins, or levelled to the ground by conflagrations, are continually battering against them; the ground, too, is shaken by earthquakes every now and then; and yet, built as they were in the days of Tarquinius Priscus, seven hundred years ago, these constructions have survived, all but unharmed. We must not omit, too, to mention one remarkable circumstance, and all the more remarkable from the fact, that the most celebrated historians have omitted to mention it. Tarquinius Priscus having commenced the sewers, and set the lower classes to work

upon them, the laboriousness and prolonged duration of the employment became equally an object of dread to them; and the consequence was that suicide was a thing of common occurrence, the citizens adopting this method of escaping their troubles. For this evil, however, the king devised a singular remedy, and one that has never been resorted to, either before that time or since: for he ordered the bodies of all who had been thus guilty of self-destruction, to be fastened to a cross, and left there as a spectacle to their fellow-citizens and a prey to birds and wild beasts. The result was, that that sense of propriety which so peculiarly attaches itself to the Roman name, and which more than once has gained a victory when the battle was all but lost, came to the rescue on this occasion as well; though for this once, the Romans were in reality its dupes, as they forgot that, though they felt shocked at the thoughts of such ignominy while alive, they would be quite insensible to any such disgrace when dead. It is said that Tarquinius made these sewers of dimensions sufficiently large to admit of a wagon laden with hay passing along them."

Apart from the great work of Frontinus on the Roman water-supply, the best consecutive treatise on hydrology and mineral waters in antiquity is to be found in Pliny (xxxi, 1-34). The old naturalist's chapters are fascinating in many details regarding the medicinal properties of various waters and the great aqueducts of the Eternal City. Natural drainage areas and watersheds for rainfall over impenetrable soil, springs, shallow wells, clear flowing streams, ponds and lakes were obviously at hand before the advent of the sunken well and transmission by piping. The superiority of flowing over still or stagnant water was known. Not all river waters proved to be equally palatable, and, to this day, deep lakes have remained natural reservoirs of the best water-supply for cities, since they do not commonly freeze over, and so furnish cool water in summer and water relatively warm in winter, at the same time being freer from fauna, flora and micro-organisms. Pliny (xxxi, 1-37) dilates on the healing properties of the mineral springs of Aquitaine, Narbonne, Baiae, the Campagna and the Pyrenees, on waters good for insanity, sterility, abortion, inebriety, lovesickness, waters that dye the hair or improve the voice and so on. He regards the boiling of water for purification as an invention of Nero, but it was already known to Hippocrates (Littré, II, 36) and Aristotle and was em-

ployed in the army of Cyrus (Herodotus, I, 188). The Castalian Spring on Mount Parnassus was sacred to Apollo and the Muses. Pindar (*Ariston men udor*), Horace (*Fons Bandusæ*) and other poets, as well as the cult of Juturna, bespeak the concern of the Greeks and the Romans for purity of water-supply. Romulus chose for the site of Rome "a place abounding Springs" (Cicero).³

A fairly complete conspectus of the status of nomadic and pastoral man in the deserts of Asia, with reference to problems of water-supply, drought, drainage, irrigation and inundation, may be pieced out by the simple process of "searching the Scriptures."

"I give waters in the wilderness and rivers in the desert, to give drink to my people, my chosen." Isaiah xliii, 20.

"There went up a mist from the earth and watered the whole face of the ground." Genesis ii, 6.

"And Lot lifted up his eyes and beheld all the plain of Jordan, that it was well watered everywhere." Genesis xiii, 10.

"And when they came to Marah, they could not drink of the waters of Marah, for they were bitter." Exodus xv, 23.

"For the Lord thy God bringeth thee into a good land, a land of brooks of water, of fountains and depths that spring out of valleys and hills." Deuteronomy viii, 7.

"But the land, whither ye go to possess it, is a land of hills and valleys and drinketh water of the rain of heaven." Deuteronomy xi, 11.

"Unstable as water, thou shalt not excel." Genesis xlix, 4.

"For we must needs die, and are as water spilt on the ground, which cannot be gathered up again." II Samuel xiv, 14.

"There shall not be dew nor rain these years." I Kings xvii, 1.

"And thou shalt be like a watered garden, and like a spring of water, whose waters fail not." Isaiah lviii, 11.

"The parched places in the wilderness, in a salt land and not inhabited." Jeremiah xvii, 6.

"The waters wear the stones; thou wastest away the things which grow out of the dust of the earth." Job xiv, 19.

³ The principal of these were the springs of the Camenae (Prophetic Nymphs), the Fons Apollinis, both in the Egerian Valley, and the Fons Juturna, near the Forum. These springs were controlled by special officials, the *magistri et ministri fontis*.

"He bindeth up the waters in his thick clouds; and the cloud is not rent under them." Job xxv, 8.

"My flesh longeth for thee in a dry and thirsty land, where no water is." Psalms lxiii, 1.

"Drink waters out of thine own cistern, and running waters out of thine own well." Proverbs v, 15.

"And the parched ground shall become a pool and the thirsty land springs of water." Isaiah xxxv, 7.

"The rain also filleth the pools." Psalms lxxxiv, 6.

"Stolen waters are sweet." Proverbs ix, 17.

"Blessed are ye that sow beside all waters." Isaiah xxxii, 20.

"When the poor and needy seek water and there is none." Isaiah xli, 17.

"And the nobles have sent their little ones to the waters; they came to the pits and found no waters; they returned with their vessels empty." Jeremiah xiv, 3.

"Behold, waters rise up out of the north, and shall be an overflowing flood, and shall overflow the land." Jeremiah xlvii, 2.

"The waters made him great, the deep set him up on high with her rivers running round about his plants, and sent out her little rivers unto all the trees of the field." Ezekiel xxxi, 4.

"There are wells without water, clouds that are carried with tempest, to whom the mist of darkness is reserved forever." II Peter ii, 17.

"A righteous man falling down before the wicked is as a troubled fountain and a corrupt spring." Proverbs xxv, 26.

"Or ever the silver cord be loosed, or the golden bowl be broken, or the pitcher be broken at the fountain or the wheel broken at the cistern." Ecclesiastes xi, 6.

"For my people have committed two evils; they have forsaken me the fountain of living waters and hewed them out cisterns, broken cisterns, that can hold no water." Jeremiah ii, 13.

"At the end of the conduit of the upper pool, in the highway of the fuller's field." Isaiah vi, 3.

"Now there is at Jerusalem by the sheep market a pool which is called in the Hebrew tongue Bethesda, having five porches." (Discovered 1888.) John v, 2.

And the rest of the acts of Hezekiah and all his might, and how he made a pool and a conduit, and brought water into the city, are they not written in the book of the chronicles of the kings of Judah?" II Kings xx, 20.

The rules in Deuteronomy (XXIII, 9-14) for the policing of a camp contain the germinal idea of the military latrine:

12. Thou shalt have a place also without the camp, whither thou shalt go forth abroad.

13. And thou shalt have a paddle upon thy weapon; and it shall be when thou wilt ease thyself abroad, then shalt dig therewith, and shalt turn back and cover that which cometh from thee.

All the essential modes of husbanding water-supply, from storage of rain-water in jars and cisterns, sinking of wells and guarding of desert springs in the oases, to ultimate piping by conduits, are in the Biblical narratives, and it is reasonable to infer that methods in Assyro-Babylonia and Egypt were substantially the same.

The great Mesopotamian plain was originally reclaimed from an uninhabitable swamp and rendered the most fertile region in the ancient world by irrigation. Of the great network of canals, the three largest, the Nahr Sarsar (Zabzallat), the Kutha and the Ar-Malcha or King's Canals, carried the waters of the Euphrates over to the Tigris above Babylon and the Pallukukatu, watering an immense tract of land parallel with the Euphrates, was probably the "Canal of the Sun God," mentioned in the ancient texts. According to Herodotus (I, 193), wheat from this region gave a 200-300 fold yield and Pliny states that it was cut twice yearly. In the city of Babylon, as Strabo (xvi, I, 5) and Diodorus Siculus (II, 10, 6) relate, water was raised from the Euphrates by means of a screw, and a reservoir has been excavated in the triangular south-east corner of the great inner wall. The water-courses were probably in keeping with the system of gigantic drains, of which models were exhibited at the hygienic exhibitions at Dresden (1911) and Stuttgart (1926). Similar arrangements for water-supply and sewage-disposal were doubtless evolved in Egypt, but as modern Alexandria stands exactly over the ancient site, now largely under water through subsidence of the coast, extensive excavation is impossible. Palestine, apart from Mount Lebanon and the fertile Mediterranean littoral, is a desert land. The river Jordan, unlike the Nile, is useless for wide-spread irrigation and there are no other flowing streams of consequence; but springs abound everywhere and the whole country is so pitted with the remains of ancient cisterns that walking by night over the fields and hills is sometimes dangerous. The most abundant springs are the sources of the Jordan (at Banias), Tell-el-Kadi and the ancient Virgin's Fountain, the only natural source of water around Jerusalem. Storage of water in the narrow-mouthed, bell-shaped cisterns, hollowed in the rock and lined with cement, was necessitated by the long period of drought (May to November) and the abundant rainfall during April-October. Remains of aqueducts exist at Jericho, Cæsarea and particularly about Jerusalem, which was supplied from the three huge reservoirs known as Solomon's Pools. Water was collected in these pools from Ain-Saleh and other springs and conveyed into the town by siphon-piping through the larger aque-

duct (mainly rock-cut) and a lower winding conduit about 20 miles long. Water was conveyed from the Virgin's Fountain to the Pool of Siloam (or Siloah), an actual reservoir of 58' x 18' x 19' dimensions under the south-east wall, by an underground conduit through the solid rock 1750 feet long, attributed to Solomon. An inscription, discovered by C. Schick, in 1880, reveals the fact that the workmen began to bore at both ends to meet somewhere in the middle. Actually, they had to shaft to locate each other, whence the conduit is 600 feet longer than the direct distance (1110 feet). At present, the main drain of the city discharges into the lower pool of Siloam, converting it into a cess-pit, with seepage into the walls, and the Fountain of the Virgin being also contaminated, the city has virtually no water-supply, by comparison with the past. The Pool of Bethesda was probably north-east of Jerusalem, near the Sheep Gate, where the remains of the five porches mentioned by St. John (V, 2) were excavated in 1888, with a twin pool about 160 yards N. W. of St. Stephen's Gate. The Brook of Kedron was a temporary rill, formed by the heavy winter showers, flowing into the ravine comprising the vale of Jehoshaphat.⁴

In present-day Palestine, arrangements for large scale irrigation and public water supply are almost entirely lacking on account of the survival of traditional methods in a country of peculiar physical conformation and the hazards of experimentation without careful study beforehand. Nearly three fourths of the country is of calcareous formation over hard limestone, in which springs are rare and the mountain freshets (abounding in the rainy season) are unavailable on account of the uneven contour of the terrain. None of the rivers except the Jordan have been utilized for irrigation or water-power, even in the orange groves of the fertile strip along the coast; and, with the exception of the oasis of Jericho, this is also true of the larger springs near the Dead Sea. In consequence, every plantation has its own rectangular well of cement, 3-5 meters wide, with piping for irrigation at the level of the ground water and withdrawal above by the ordinary lever pump or an oil motor. Earlier types of rope-and-wheel wells (the wheel of Ecclesiastes) or capstan wells, run by mules or camels, are disappearing. Practically every house in Jerusalem has a cistern for storage of rain-water, as piped water is too expensive (about 60 cents per cubic meter). The Biblical Solomon's Pools still exist in the shape of three gigantic basins of sunken masonry, 10 meters deep and with a total capacity of 200,000 cubic meters. With a rainfall often averaging 70 millimeters daily in the season, cisterns are easily filled. Dams for irrigation are hardly feasible, as rainwater is rapidly absorbed by the chalky soil.⁵

Similar conditions obtained in ancient Persia and methods of supply were adapted to the contour and geological formation, whereas in Egypt and Assyro-Babylonia, the

⁴ For further details, see J. I. Whitty: Proposed Water Supply and Sewerage for Jerusalem, London, 1863.

⁵ S. Löwengart, Umschau, Frankf. a. M., 1929, xxx, 271-273.

presence of great rivers, subject to inundation, made for supply by open canals with spacious basins. Before the Roman period, the Phœnicians were the ablest sanitary engineers.

Remarkable were their rock-hewn, subterranean conduits in Cyprus (Citium, Amathus) and the four deep artesian wells near Tyre, piping water 18-20 feet upward into four octagonal towers, whence it was carried by conduits to reservoirs near the shore. Remains of 16 Greek subterranean tunnels, draining Lake Copais in Bœotia, have been found, similar to those described in Polybius and others excavated in Syria and Asia Minor. Natural springs and rock-hewn cisterns were adequate for the smaller Greek communities in the earlier period, but with growth of the population came tunnels, like those made by Eupalinus for the water supply of Megara and of Samos, channeled through a hill supplied to fountains, baths and sewers by piping from a terminal masonry conduit, and ultimately debouching into the harbor (Herodotus III, 60). Athens was supplied by rock-cut conduits passing under the bed of the Ilissus from Hymettus and from Pentelicus, both fusing into a large reservoir outside the city, whence it was conveyed within by a network of underground channels, usually stone-walled, and in one case, large enough for two men to pass through. Another Roman conduit, from Pentelicus, begun by the Emperor Hadrian (117-138 A. D.) and completed by Antonius Pius (138-161 A. D.) is still used and was repaired in 1869. In the Island of Cos, an aqueduct, leading from the Fountain of Hippocrates (Burinna) on Mount Lebanon, has been excavated, consisting of an underground bell-shaped reservoir supplied by the spring, in the side of the hill, ventilated by a shaft from above and leading into a subterranean conduit 114' long and 6' wide.

The eleven aqueducts of Rome were among the chief glories of the city and veritable triumphs of Roman sanitary engineering. Nine of these are described in the *De aqueductibus urbis Romanæ* of Sextus Julius Frontinus (35-104 A. D.), a Roman soldier who was city prætor, augur, three times consul (75, 98, 100), Governor of Britain (76-78) and appointed water-commissioner (*curator aquarum*) in 97. He lived under the beneficent reigns of Vespasian, Titus, Domitian, Nerva and Trajan, served in several campaigns and wrote treatises on strategy and the art of war. His book on Roman water-supply has been translated from the only existing MS. in the Monastery at Monte Cassino by Clemens Herschel (Boston, 1899). The nine aqueducts described by Frontinus were:

1. The Aqua Appia, constructed 312 B. C., by the censor, Appius Claudius Caecus, and running 11 miles from the Via Collatina to the Porta Trigemina. The Appia ran from a spring located by Appius and the finder of springs (*Venox*)⁶ above Tivoli, in the Campagna valley of the Anio. It crossed a valley of 300 feet on low arches, proceeding to the *Salinae* (salt-warehouses), whence it was distributed from cisterns by lead-piping.

2. The Anio Velus (272-269 B. C.), 43 miles in length, constructed by the censor Marcus Curius Dentatus, had its intake out of the Anio River near Tivoli and about two miles from Rome, subdivided into two branches for distribution. The channel (*specus*) was 3.7 feet wide x 8 feet high, built out of massive blocks of masonry (*opus quadratum*) laid in cement (*opus signinum*) and plastered on the inside. About 1100 feet were above ground.

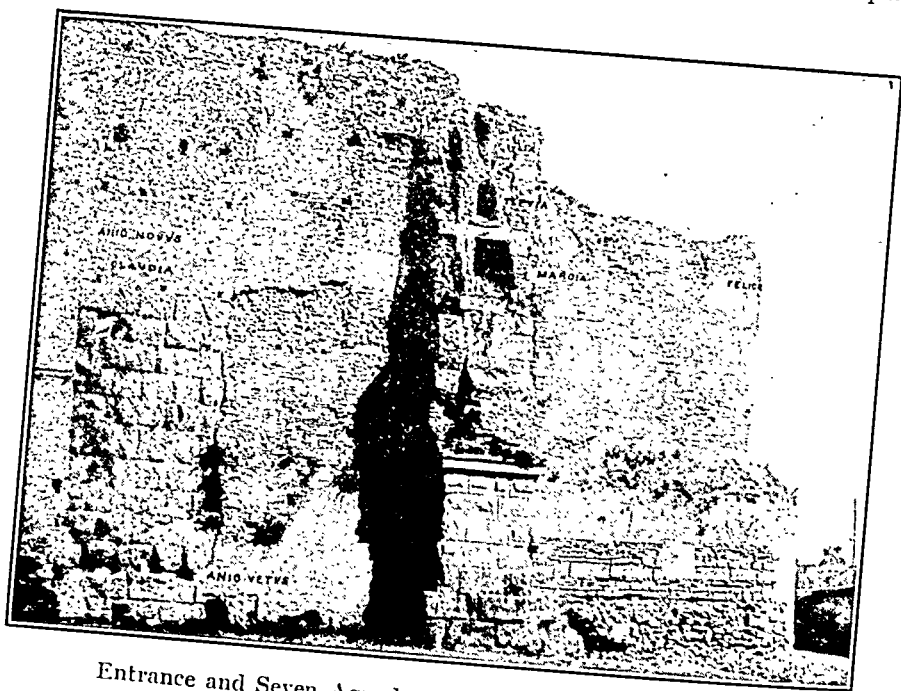
3. The Aqua Marcia (146 B. C.), constructed by the prætor, Quintus Marcius Rex, sprang from the Serena springs on the north bank of the Anio, near Agosta and covered $6\frac{1}{4}$ miles, $7\frac{1}{2}$ of which were above ground on high arches. In 5 B. C., Augustus Caesar reënforced it by the Aqua Augusta, leading into it from the Rosolina Spring, near Agosta. It was repaired or restored by Titus, Septimus Severus, Caracalla and Diocletian; and was reconstructed in 1869-70 by Pope Pius IX as the Aqua Pia or Marcia Pia. The waters of the Marcian Aqueduct were notable for coolness and purity. The aqueduct itself, the first to run for a long distance on high arches, was celebrated by Pliny, Martial, Statius, Tacitus, Vitruvius and even by Shakespeare (*Coriolanus*, ii, 3) as one of the architectural glories of Rome. Like its predecessors, the Aqua Marcia was built of rough-hewn "dimension-stone," but soon thereafter the Romans began to be expert in the use of concrete, made from pottery and reënforced by a tough cement made from powdered pottery mixed with lime or volcanic earths. Superimposed upon the arches of the Aqua Marcia for the last $6\frac{1}{2}$ miles of its course above ground was

4. The Aqua Tepula, completed 125 B. C. by the censors Cnaeus Servilius Caepio and L. Cassius Longinus, which arose from volcanic springs on the slopes of the Alban Mountains (the present Sorgenti Preciosa) and reached Rome on the top of the Marcia, a total course of 11 miles. The structure is of reënforced concrete throughout. The water being warm (63° F), and not of particularly good quality, it was after 92 years, ultimately mixed with water from

5. The Aqua Julia (33 B. C.), constructed by Vipsanius Agrippa, which arose from colder springs, two miles away from the Sorgenti Preciosa, and after running for $4\frac{1}{2}$ miles on its own, was superimposed upon the Tepula for the rest of its course (total length $15\frac{1}{2}$ miles). The temperature of the water was thus reduced to 53° F by the mixture at the junction. At the Porta Tiburtina, the Marcia, Tepula and Julia are still recog-

⁶ A precursor of the expert with the divining rod.

nizable, piled on top of one another as they cross the gateway. In 272 A. D., the three superimposed arches were incorporated into the Wall of Aurelian and ultimately crowded out by the Aqua Felice (1585). The inscription on the boundary stone reads: AQUA . IULIA . IMP . CAESAR . DIVI . F . AUGUSTUS . EX . S . C . CLVI . PEDES . CCXL. (The Julian Aqueduct, Augustus Caesar, Emperor, son of the deified [Julius] Caesar. By vote of the Senate. Station 156, distance apart 240 feet.)

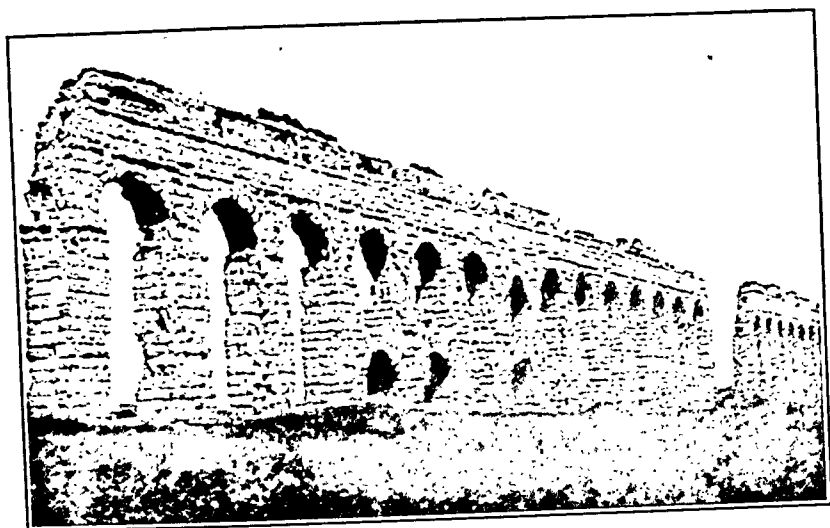


Entrance and Seven Aqueducts near Porta Maggiore, Rome

6. The Aqua Virgo (33-19 B. C.), also built by Vipsanius Agrippa, arose from a spring on the Via Collatina, in the Campagna valley of the Anio and ran for 14 miles at a low level, entering Rome "under the Pincian hill, to the north of the Piazza di Spagna, with a reservoir near the present Via del Babuino at the end of the Vicolo del Bottino." Being celebrated for its excellent water supply, it was restored to use by Pope Pius V in 1570, and now supplies the ship-fountain in the Piazza di Spagna, ending at the fountain of Trevi.

7. The Aqua Alsietina (10 A. D.), arose from the present Lago di Martignane across the Tiber, 680 feet above sea-level, and ran for 22 miles on a down grade, to supply the water for a marine circus (*naumachia*), for which purpose, as shown by the Ancyrean inscription, it was constructed by Augustus Caesar.

8. The Aqua Claudia (38-52 A. D.), built of dimension stone, with



Aqua Claudia with Anio Novus above (Roman Campagna)

9. The Anio Novus (38-52 A. D.), of brick and concrete on top of it for 7 miles, were begun under Caligula (38 A. D.), and completed under Claudius (52 A. D.) Claudia arose from three springs in the Anio Valley, near the sources of the Marcia, and ran for 45 miles, over 10 of which it rose on arches above ground. Anio Novus got its intake from the Anio River, was 62 miles long, over 9 miles above ground, and acquired an additional intake under Trajan (98-117 A. D.) from one of the three artificial lakes which adorned Nero's Villa above Subiaco. The two aqueducts were hastily constructed and had to be restored by Vespasian (A. D. 70) and Titus (A. D. 81). The ruins of the majestic span of double arches, lauded by Cassiodorus as more beautiful than the Nile, are still one of the features of the Campagna. After Frontinus' time, there came into use

10. The Aqua Trajana (A. D. 109), constructed by Trajan, arising from the present Lago di Bracciano, following nearly the same route as the Alsietina (on the right bank of the Tiber) for over $36\frac{1}{2}$ miles and even higher than Anio Novus. It was restored by Pope Paul V (Aqua Paola) in 1611, but, coming from an inferior intake, is no longer fit for drinking.

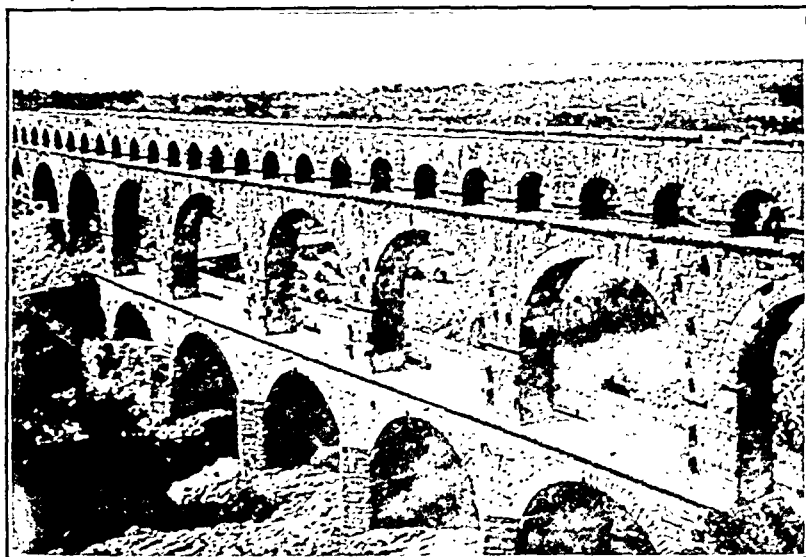
11. The Aqua Alexandrina or Hadriana (A. D. 226), built by Alexander Severus, arose from springs between the Via Praenestina and the Via Labicana, 14 miles from Rome, which now supply its mate, the present subterranean Aqua Felice, constructed by Pope Sixtus V in 1585.

The Romans reared these majestic structures across valleys and rivers solely for the economic reason that lead-piping underground was weak, bronze expensive and the casting of large pipes, withstanding great pressure, be-

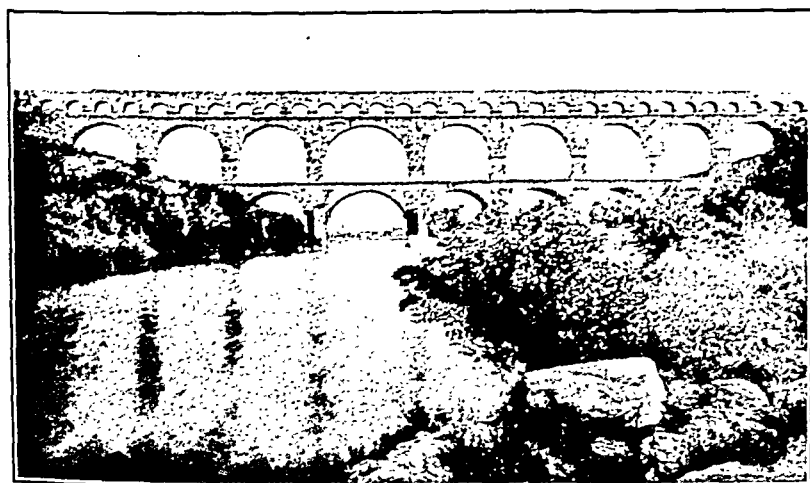
yond their powers of invention. Necessary repairs and detection of leakage were, furthermore, easier in the case of the archways than underground, as evidenced by the system of superimposed double and triple arches in the case of Claudia-Anio-Novus and Marcia-Tepula-Julia respectively. How it was all done is largely a matter of conjecture. Tunnels were either chiselled out of the solid rock by the pick or excavation was effected by pouring cold water or vinegar upon heated rock. The Romans were ignorant of blasting, but they knew that water seeks its level (Pliny xxxi, 57), hence employed siphonage and inverted siphonage in supplying fountains and upper stories, levelling by means of the *Chorobates* (Vitruvius, VIII, 6). They made air-shafts (*lumina*) in the water-courses at intervals of 240 feet, separated out sediment and pebbles by vaulted filter tanks (*piscinac*) delivered the water from terminal reservoirs (*castella*) to bath-tubs and fountains by lead-piping, stop-cocks, wipe-joints and other plumber's fixtures, lifted the huge dimension stones by derricks and effected construction and repair by slave labor and virtual enslavement of soldiery; but they had no means of measuring relations of quantity and velocity of flow in a pipe, so that more than half the water transmitted was lost through unscrupulous tapping and leakage. Herschel estimates a total discharge of 84 million gallons (54 within, 30 without) and a daily consumption of 20 million gallons (38 gallons per person). The cost of construction was high. Pliny (xxvi, 24) estimates the cost of the Claudia and Anio Novus at 55.5 million sestertii (nearly three million dollars) or about \$6 per running foot by slave labor (Herschel). Nevertheless, aqueducts swarmed over the entire Roman Empire. Pliny the younger records building two in the year or so of his proconsulate, and 200 or more probably existed throughout the Empire. Apart from Rome, the most important and impressive of the colonial aqueducts in size and height were

† The gravitational formula for estimating the velocity of water flowing from an orifice ($V = \sqrt{2gh}$) was first stated simultaneously by John and Daniel Bernouilli in 1738 (Herschel). Daniel Bernouilli was an M. D.

1. The aqueduct-bridge at Nîmes (Nemausus), now known as the Pont du Gard, constructed by Vipsanius Agrippa (under Augustus) and crossing the valley of the Gardon River at a height of 160 feet, one of the most beautiful bridges in the world.

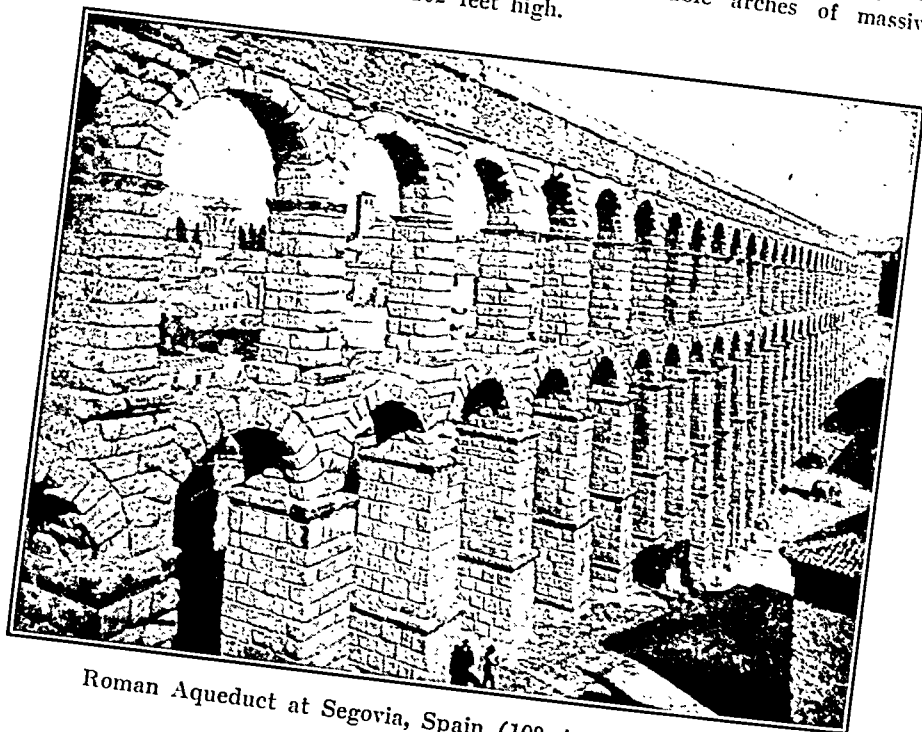


Pont du Gard, Nîmes (Perspective)

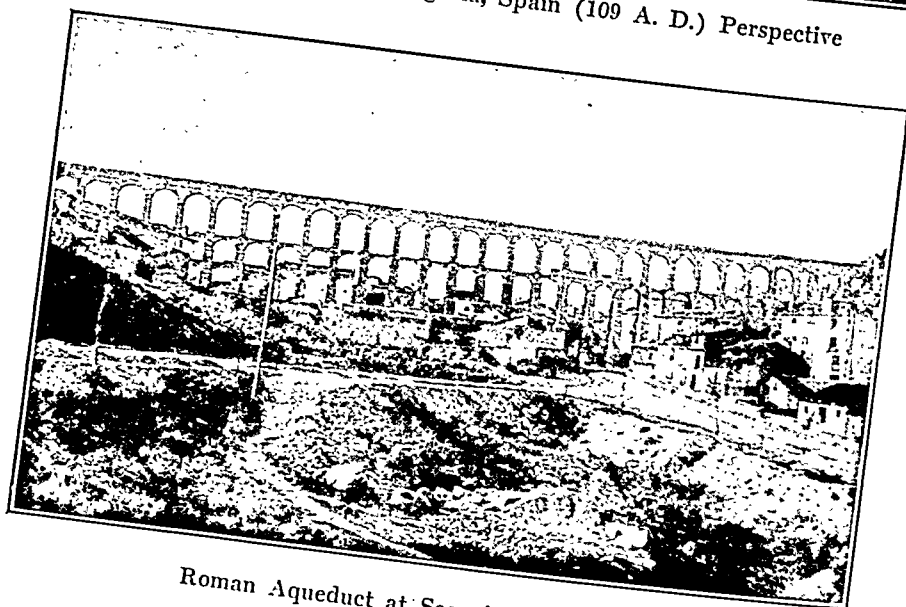


Pont du Gard, Nîmes (Front View)

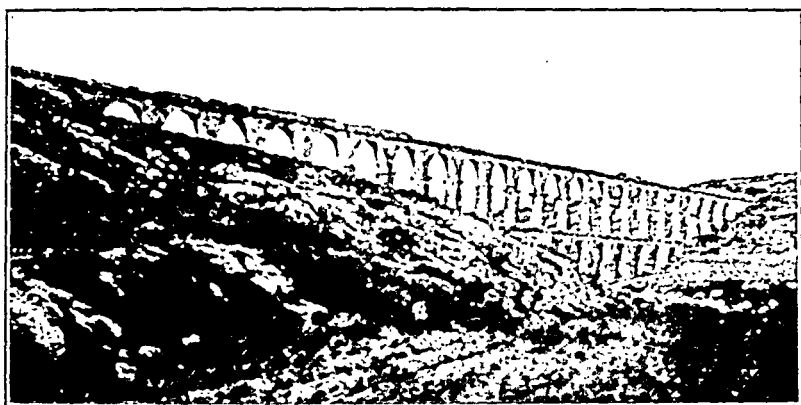
2. The aqueduct bridges at Segovia, Tarragona (restored 1780-1800) and Merida (Spain), the first consisting of 109 double arches of massive masonry 2400 feet long and 102 feet high.



Roman Aqueduct at Segovia, Spain (109 A. D.) Perspective



Roman Aqueduct at Segovia (Front View)



Roman Aqueduct at Tarragona, Spain

3. The camp aqueduct bridges at Mainz (700 yards long, half resting on nearly 600 pillars) and Lunnes.

4. The aqueduct at Jouy-aux-Arches, near Metz, (11th century A. D.)

5. The aqueduct bridges at Antioch (Syria), 700 feet long and 200 feet high, and at Moris, near Mitylene, 500 feet long and 70-80 feet high.

Weber has made an exhaustive study of ancient and mediæval aqueducts of Greek and Roman provenance at Pergamum, Laodicea, Smyrna, Tralles, Aphrodisias, Trapezopolis and other cities in Asia Minor. The most remarkable of the mediæval aqueducts were the present bridge at Spoleto (7th-8th centuries), with 10 Gothic arches, 300 feet high, and a span of 60 feet; and the system of aqueducts supplying Constantinople. These were:

1. The "Crooked Aqueduct," consisting of two branches, one of two tiers of semicircular arches superimposed upon a row of Gothic arches (670 feet long and 106 feet high) and the other of 12 semicircular arches (300 feet long) conveying water collected from springs on Mount Haemus (in a reservoir below Belgrad) into (2.) the Long Aqueduct and (3.) the "Hanging Aqueduct" of Justinian, and finally into a vaulted conduit which ultimately rises above ground as an aqueduct of two arches, meandering thence to the reservoir of Egri Kapu, on the walls of Constantinople, for distribution into the city. The Long Aqueduct, consisting of two tiers of about 50 arches, 2200 feet long, 80 feet high, is evidently of Turkish design and construction.

The Aqueduct of Justinian, 720 feet long, 108 feet high, consists of two tiers of large pointed arches, with span of 55 and 40 feet, supported by huge buttresses broken at different heights by small lateral arches, in all one of the finest aqueducts of the Middle Ages. In addition to these, water was supplied to the northern side of Constantinople by a system

of aqueduct bridges over valleys, with intervening water-towers of obelisk type (*souterasi*), for siphonage and discharge of air. The city is still supplied by the Crooked Aqueduct and the aqueducts of Justinian and Valens, to be stored in various cisterns, one of a capacity 6,571,720 cubic feet. In the Byzantine period, the total supply through the different aqueducts amounted to 400,000 cubic feet *per diem* (Andreossy).

The mediæval house was usually a small two-storied affair, with few windows and heating only in the bath-room; but the spacious palaces and public buildings were invested at the back by galleries supplied with water-closets. The most remarkable of these were the castles and chapter-houses of the Order of the Teutonic Knights in Eastern Prussia (1229-1525) with their subterranean central heating plants (hypocausts). wells sunk in the premises, water-piping, baths, wash-rooms and tower-latrines (*Dansker-Anlagen*), separated from the main building by rambling galleries, with running water-courses underneath to remove excreta. The most striking of these are at Marienwerder, Thorn, Königsburg and Lockstedt. The Palazzo Davanzati in Florence (1300), recently restored, had separate water-closets attached to each of the spacious dwelling-rooms (3-4) on each of the three stories. Water-closets, and sometimes urinals, also existed in the fortified Castle at Lucera (1233), built by Frederick II, the Castel del Monte in Apulia (1240), the Hohenstauffen palace at Lagopesole (1250), the cloister at Saint Gall and in such riverside castles as those at Bachrach and Oberwesel on the Rhine or Eltz on the Moselle. Sometimes privies or urinals were inset by a blind archway in city walls or city gates, as at Aigues-Mortes (12th century), or in the battlements of fortified castles. The device of disposal by still ponds or running water underneath the privies probably derived from the lake-dwellings of pre-historic man, and is still noticeable in the Philippines. In the smaller towns and the open countryside, domestic arrangements were of the most primitive order, as suggested by the status of Berlin or Naples in the early part of the 19th century or the memoirs of Benvenuto Cellini and Casanova. For a long time, even the sick or the dying lay naked in their beds, with the customary utensil under-

neath, the theme of many droll anecdotes and caricatures. Doctors diagnosed disease at a distance by inspection of the urine, conveyed in flasks of Erlenmeyer shape. Soap and the sweat-bath were introduced by the Teutons, whose proclivity for swimming and the daily warm bath had already been noted by the Roman writers. Communal bathing, in special establishments for the purpose, was developed on an immense scale by the Scandinavians, Teutons and Slavs, and even in private houses, the heated bath-room, or the curtained bath-tub in the summer garden, were found pleasurable enough for a long sojourn, diversified by eating, drinking and playing on musical instruments. In the larger establishments, cupping and venesection were done. The utilization of the public baths for pleasure of all kinds has been amusingly depicted by such artists as Dürer, Lucas Cranach, the younger Holbein, Beham, Aldegrever, Grün, and Bock. Commingling of the sexes eventually led to immorality and venereal in-



German Bath-House (Renaissance). Heated from Below

fection, with consequent suppression of these establishments, which had been supported by weekly subscription. The custom extended from the Scandinavian peninsula to Hungary and Switzerland, still exists in Finland and was noticed in Buda Pest by Richard Bright (1814) and latterly by Hopkinson Smith and others. The innumerable paintings of the fair Bathsheba and of Susanna and the Elders afford another pleasant sidelight on the popularity of bathing in these early days. Portable water was delivered to dwelling houses by strolling water-carriers (Cherubini's opera), as in Constantinople or Moscow, from large cans by teamsters, as in present day Manila, or from wells, town-pumps or running springs set in masonry. Washing of the hands in basins after meals or of the feet after a long journey, sometimes as a religious ceremonial, was common custom. From the Biblical episode of Rebecca to the canvasses of Greuze, Fragonard and Anselm Feuerbach, from the scene in Goethe's Faust to the novel of Knut Hamsen, the wayside well has ever been a favorite theme of poet, painter and novelist. The use of mineral waters and baths began with the Romans and, in Germany alone, has expanded to the scale suggested by the *Deutsches Bäderbuch*. Innumerable sanitary ordinances of the mediæval towns, exhumed by Sudhoff and others, indicate the concern of the people about purity of water, the prevention of nuisances, the removal of dead animals and of filth from the public highways and byways. These municipal edicts increase in number toward the middle of the 18th century and for obvious reasons. Sudhoff, in his Dresden Catalogue, lists, in succession, a poetic citation of the 13th century as to the mischances arising from lack of privies, a 14th century memorial of the Fathers of San Lorenzo on Florentine conditions, registrations of privies over the London streets in the *Liber albus Londinensis* (14th century), sidelights from the Decameron of Boccaccio (1344-50), a colored print from Grimani as to lack of facilities for public comfort in 16th century Rome, and a mocking 17th century verse about the urinal in the palace at Versailles. By the 16th century, the water-closet had

force. During 1831-92, Hamburg had been exposed to cholera 23 times and the example of nearby Altona, which escaped the epidemic of 1892 by previous installation of a filter-plant, afforded an object-lesson. The work was sped by intensive coöperation on all sides and on May 27, 1893, Hamburg was supplied with pure, filtered water, which has stood the test to date. This Elbe system, supplied at Billwarder Island and filtered at Kalterhofe, is the largest surface system on the continent. In 1905, the first underground water system was laid at Billbrook and with the installation of the underground system at Curslack in 1928 (114,000 cubic meters daily), the use of Elbe water was virtually excluded. The cost of the total Hamburg supply, including the Elbe, Billbrook and Curslack systems, the pumping works at Rothenburg Place, the piping, filter-plants and reservoirs, is estimated at about 70 million marks (17½ million dollars). The annual consumption is about 62 million cubic meters (170,000 daily or 152 liters per head *per diem*).

This history is fairly typical of the ups and downs incident to the acquisition of the filtered supplies of pure water with which most of the going, or up-and-coming, cities of the world are now provided.

The history of the London water supply¹⁰ suggests the long periods in which a fairly good supply may suffice for a slowly growing population and the coöperative effort necessary to administrate and provide for a population expanding toward eight millions.

Prior to 1582, the citizens of London obtained their water precisely as did the Hamburgers, by simple bucketing from the Thames or from such shallow wells or springs as Holywell, Clerkenwell or St. Clement's Well, "when on a summer's evening they are disposed to take an airing" (Fitz Stephen). In 1236, Henry III authorized Gilbert Sanford to convey water from Tyburn to London by lead-piping, and these conduit heads were frequently visited in state by the Lord Mayor and other dignitaries, when hunting. In 1582, Peter Morrys, a Dutch engineer, submitted a plan for pumping Thames water to a height for distribution, by means of "forciers" (tidal water-wheels) to be set in certain of the 19 arches of the old London Bridge, a system destined to be the means of the London supply for 240 years (1582-1822). The Lord Mayor "and a goodly companie" saw Morrys throw water over St. Magnus steeple and forthwith granted him a lease of the first arch for 500 years at 10s per annum, with a subsequent lease of the second arch on the same terms in 1584. A third arch was leased to Morrys' grandson in 1701, a fourth to his company in 1761,

¹⁰ Col. Sir F. Bolton: *London Water Supply*. New ed., by P. O. Scratchley. London, 1888.

and a fifth (on the Southwark side) in 1767. The closure of the archways by these ponderous wheel-works, with the further obstruction by piles around the piers, so dammed the tide at flow, that at ebb, it made for dangerous rapids and eddies, the subject of frequent complaint by the wharfingers and lightermen, who had to shoot them. The wheel water works supplied four million gallons daily, distributed to the city by ten separate sets of main pipes. In 1822, the old London Bridge and the water-works were demolished by Act of Parliament. Meanwhile, there had come into being no less than eight Metropolitan Water Companies, eventually consolidated by the Metropolis Water Act of 1871, viz.:

1. The New River Company, started April 21, 1609, under Parliamentary authorization (Acts of 1605-6), partly financed by Sir Hugh Myddleton, and inaugurated on September 29, 1613, by James I, who reimbursed Myddleton to the extent of half the cost of construction (1612-16). This is supplied by Chadwell spring, the River Lee near Ware, and 13 chalk wells in the Lee Valley. The channel, originally 40 miles long, was completed in five years (1609-13) and affords an unlimited supply. The inauguration (entrance of the water) on Michaelmas Day, 1613, was the occasion of great festivities.

2. The East London Water-Works established by an Act of 1807, authorizing the purchase of the Shadwell Waterworks Company, (1669, authorized 1691), and the West Ham Waterworks (1747) from the London Dock Company. This company supplies East London, Stratford, Bow and vicinity from the River Lee at Chingford, by a settling reservoir at old Ford (11 acres) and a service reservoir, with pumping machinery (The Twins) at East End. The supply, which also comes from the Thames at Sunbury and from chalk wells at Walthamstow and Chingford, is limited to 10 million gallons daily (Act of 1867).

3. The Chelsea Waterworks Company, chartered (1723) and warranted (1726-7) under George I, originally took water from the Thames at Chelsea (North Bank), with filter-beds (1829), which were moved up the river to Surbiton (1852-6), to avoid tidal contamination. The present intake is at West Molesey (South Bank), with 7 filter-beds at Surbiton and 3 service reservoirs at Putney Heath. The supply is 22 million gallons daily.

4. The Southwark (1771-1822) and Vauxhall (1804) Companies, amalgamated October, 1845, supplied South London from the Thames above Hampton, whence it is pumped to the filter-beds (1855) and reservoir (1869-70) at Battersea, with additional works at Peckham (1871), a high service reservoir at Forest Hill (1886) and a 42 inch main from Hampton to Nunhead. The supply is $24\frac{1}{2}$ million gallons daily.

5. The Lambeth Company was established by Act of 1785, originally at Ditton (Belvedere Road), present intake being at Molesey (1847), with pumping station and filter beds at Ditton (1848) and covered reservoirs at Streatham (1832), Ditton (1848), Rock Hill (1854-5), Selhurst (1859-61), Coombe, Kingston Hill (1863) and Norwood (1876-7). The supply (to the Lambeth District) is $24\frac{1}{2}$ million gallons daily.

6. The Grand Junction Waterworks Company (1811), originally authorized as the Grand Junction Canal Company (1798), supplied part of West London from a station at Paddington (1798), subsequently moved up the river above Kew Bridge (1835) and now comprises pumping stations, filter beds, subsidence reservoirs and covered storage reservoirs at Hampton, Kew Bridge, Campden Hill (Kensington), Shoot-up Hill (Kilburn) and Mount Park (Ealing). The present supply is $24\frac{1}{2}$ million gallons daily.

7. The West Middlesex Waterworks Company was incorporated under George III (1806), with intake above the other works at Hampton and four subsidence reservoirs at Barnes, passing under the river to a pumping station and filter beds at Hammersmith to be distributed to covered reservoirs at Campden Hill, Barrow Hill and Kidderpore. The daily supply is $24\frac{1}{2}$ million gallons.

8. The Kent Waterworks was incorporated by Act of 1809, authorizing purchase of the Ravensbourne Waterworks (1701), is supplied from chalk wells near Grayford and Deptford, with pumping stations at these and four other places and 12 covered reservoirs. As the Company ceased to take water from the River at Ravensbourne in 1862, there is no need of filtration of the clear, pure well water. The average daily supply (1888) was 11,039,412 gallons.

As most of this vast bulk of water comes from the tidal reaches of the Thames, agitation for filtration began early, notably in the "Dolphin" (1827), which pointed out that the filth in the water was swallowed but seldom smelt or tasted. When the cess-pool system was abolished by the Health of Towns Commission (1845), the new system of sewers gradually discharged into the Thames. The cholera epidemics of 1845 and 1849 led to the Metropolis Water Act (1852), making it illegal to take Thames water for domestic use below Teddington Lock. In consequence, all the eight companies were constrained to move their works up the river and to roof in or otherwise cover their distribution reservoirs. Meanwhile, administration of the eight companies was divided and decentralized by the fact that the London County Council exerted authority over only one-third of "Water London," an area of 620 square miles, extending from Ware (Hertfordshire) to Sevenoaks (Kent), Ealing and Sunbury (Middlesex). On recommendation of the Royal Commissions of 1893, large additional storage reservoirs were constructed jointly at Staines (Middlesex) by the New River, West Middlesex and Grand Junction Companies. In 1902, the Metropolis Water Act created the Metropolitan Water Board, authorized to purchase and manage the eight companies, which went into effect on June 24, 1904. In June, 1925, the great Queen Mary Reservoir at Littleton, with a surface area of 723 acres and a capacity of 6,750 million gallons, was opened by King George. In 1916, the Board decided to save coal by chlorinating the water, which then flows by gravity down the Staines Aqueduct in lieu of pumping into the reservoir. It is estimated that the

average daily London consumption (36 gallons per head) would empty a tank as large as Trafalgar Square ($2\frac{1}{2}$ acres) and as high as Nelson's column $\frac{1}{2}$ times daily. In other words, the average daily consumption for the population of 1921 (7,180,201) was nearly 270 million gallons.

Following the great fire of 1842, the present sewerage system of Hamburg was begun by William Lindley, the creator of its centric water supply (1845-9). In England, the example set by this installation led to the appointment of the Health of Towns Commission (1843), which rendered two reports (1844-5) revealing the evils resulting from accumulation of filth in cities. While views at this time were inspired by the pythogenic theory of Chadwick and Murchison, that disease arises *de novo* from decomposing filth, the theory was sufficiently correct in its bearings to bring about important results. For while cleanliness may not always connote abolition of communicable diseases, sanitation does connote cleanliness. In 1847, it became obligatory to discharge all sewage into the London drains, which hitherto had received only kitchen wastes. The present sewer system, begun in 1849, was continued by the Metropolitan Board of Works (1856-88) from plans by Sir James Bazalguette (1859-75) and was completed by the London County Council (288 miles). The water carriage system (*sewage-disposal by dilution*) shifted the problem "from the individual to the community" (Winslow). The natural outlet was the nearest body of water and whether for riverside, lakeside or seaside disposal, the system worked as long as the volume of sewage was not too great for rapid dilution and the process of self-purification (oxidation of organic matter) by micro-organisms, which is slow in running water of any kind. For the subjoined account of the six experimental methods employed before the advent of the activated sludge process, I am entirely indebted to the admirable monograph of Winslow and Phelps. (1906).¹¹

¹¹ C.-E. A. Winslow & E. B. Phelps: Dept. Interior, U. S. Geol. Survey. Water-Supply and Irrigation Papers, No. 185, Washington, 1906. For later developments, see C. Imhoff: Fortschritte der Abwasserreinigung, Berlin, 1925. For the sewerage systems of various towns, see Rep. Metrop. Sewer Commission, N. Y., 1914, 436-481.

In 1857, the Sewage of Towns Commission (1857) rendered three reports on the best ways and means of distribution (1858-65), stressing the advantages of sewage farming at Milan. These were followed by the six reports (1870-74) of the Rivers Pollution Commission (1868). The net result of these and subsequent investigations was to the effect that a stream is not likely to purify more than $1/50$ of its volume of sewage (Winslow), that a stream contaminated with $1/20$ its volume of sewage and flowing at the rate of a mile an hour, will have to flow 168 miles in order to purify $2/3$ of its sewage, that purification will be more rapid in sluggish streams by virtue of sedimentation and that the best way out is to purify town sewage by farming it on land. Progress in sewage disposal by *broad irrigation* was rapid. In England, sewage farms were established at Croydon (1861), Aldershot (1869), South Norwood (1864), Rugby (1867), Altrincham (1870), Nottingham (1880), Leicester (1891) and Cambridge (1895). The first in Germany was outside Danzig (1300 acres), and was managed by Alexander Aird for 32 years (1869-1901). Following the installation of the Paris sewers by F.-F.-E. Belgrand (1854-56) farms were established at Gennevilliers, Achères, the forest of Saint-Germain and elsewhere (13,338 acres) by Mille, Buffet and Durand-Claye (1866-73). These are used for pasturage and raising table vegetables. The Berlin sewers were constructed by Baurat James Hobrecht (1873-83) and the first sewage farm was started at Osdorf (1876), in consequence of the exhaustive reports of Virchow (1868-73). Three other areas were subsequently utilized at Falkenburg (1879), Grossbeeren and Malchow (1882). These farms (22,881 acres) are now the largest in the world, the crops being chiefly timothy and ryegrass. The first sewage farm to be established in the United States was at Cheyenne, Wyoming (1883), which was followed by many others in the Western deserts, where "the manurial value of sewage is reënforced by its water-value" (Winslow). The largest are near Los Angeles and Salt Lake City. The success of the Los Angeles experiment caused a boom in real-estate values (from \$2.50 to \$25.00 an acre), with such an increase in the population that the sewage became a nuisance and had to be diverted elsewhere. In England, on the other hand, it was found that while sewage farming affords an astonishing yield in some seasons and always covers overhead expenses, it never showed profit as interest on the original investment. In our Eastern states, it is out of the question by reason of the high cost and poor quality of the land and the heavy spring and autumnal rains which defeat its objects. As the population of large cities increased, the problem of pollution became momentous, even with seaside or lakeside towns. Chicago drank its own sewage before the opening of the New Drainage Canal (1892-1900) and even later. Evacuation into the sea became a serious nuisance to Boston as early as 1876. Dibdin estimated that 200 tons of oxygen are necessary to purify the Thames between Teddington (the terminus of London water-supply) and Southbend (1904). In 1884, a third Metropolitan Sewage Commission (appointed 1882) reported that chemical treatment of London sewage was essential for the Thames, while

in Massachusetts, the reports of William Ripley Nichols and other experts (1881-85) led to the foundation of the Lawrence Experiment Station (1886), with the establishment of purification plants in 23 cities during the next decade. During 1856-76, no less than 416 processes for *chemical precipitation* of sewage had been patented in England. Exhaustive studies of W. J. Dibdin showed that lime and iron salts are the best agents. Following the recommendations of 1881, chemical precipitation works were constructed (1865), at the two outfalls for sewage north of the Thames (Barking Creek) and the south-side (Crossness) and treatment with lime and ferrous sulphate became the rule for the next ten years. By 1895, when Millbury (Mass.), brought suit against the city of Worcester for nuisances resulting from sewage disposal, chemical precipitation became discredited, through its expensive character, the difficulty in disposal of the worthless sludge and the imperfect purification of the effluent. Meanwhile, a third method had come into vogue, viz., purification by *intermittent filtration through sand*, which again turns upon nitrification and ultimate oxidation by bacteria. This theory of *bacterial purification* was first stated and demonstrated in Germany, put to practical application in England, and its chemical nature elucidated in Massachusetts. In 1865, Alexander Mueller expounded purification as a digestive process carried out by animal and vegetable micro-organisms,¹² and subsequently patented a process in which yeast-like organisms were to be used (1878). That the organisms in question are bacteria was first shown by Schloesing and Müntz (1877). The practical advantages of slow, intermittent downward filtration through coarse gravel were demonstrated by Sir Edward Frankland (1870), who perceived the chemical nature of the process (oxidation to H_2O , CO_2 and nitrates) and likened it to the cycles in respiration, but overlooked the rôle of bacteria. Frankland's principle of a resting (aërating) period between applications of sewage was successfully demonstrated in an intermittent sand filter constructed by Bailey-Denton (1871) at Merthyr Tydvil (Wales), with an eye to making broad irrigation more intensive and remunerative for agricultural purposes. In 1887, Mills, Drown, Sedgwick and Haven, at the Lawrence Experiment Station, demonstrated that the nitrification of sewage by intermittent filtration is a process of oxidation by bacteria, the oxygen being supplied in the resting periods and the porous soil serving as a *point d'appui* for the bacteria. The nitrifying bacteria were isolated in 1890 by Winogradsky in France and E. O. Jordan at Lawrence, where Hazen (1891) showed the relatively long life of intermittent filters, if the dry cake be steadily raked and scraped off the surface of the beds. Intermittent filtration was rapidly established at Framingham (1889), Marlboro (1890), Pittsfield (1890), Gardner (1891), West-

¹² Aristotle (*Historia animalium*, V, 8) was the first to associate the changes in color of the slime of wells with the development of "ascarid" (*Chironomus*) larvæ, but he wrongly reasoned that the larvæ came from the mud and the *Culex* mosquito (*empis*) from the larvæ. A. Thienemann: *Festschr. d. Versamml. deutsch. Naturf. u. Aerzte, Münster, 1912*, 175-180.

boro (1891) and other Massachusetts towns. Its success turns upon availability of sandy (porous soil) and minimum sedimentation *via* application of weak sewage. The fourth method of sewage treatment, anaërobic putrefaction in closed "septic tanks" already existed in *posse* in cesspools, the *fosses fixes* and *fosses sèches* of the French and the *vidange automatique* or water-sealed tank of Mouras (1860), patented in 1892. Sewage tanks of this type were constructed by Scott-Moncrief, at Ashtead, England (1891), and by C. N. Talbot at Urbana, Illinois (1894) but anaërobic purification was first made viable by Donald Cameron, who installed the first successful "septic tank" at Exeter, England (1895). It soon became apparent that closure of the tank is not essential, since the chemical reactions involved (sedimentation and subsequent fermentation of solids) are obtainable by slow passage through open tanks. The process is not strictly anaërobic and accumulation of sludge is variable in different filters. Septic tanks seem most successful in small towns or institutions where sandy areas for intermittent filtration are not available, e.g., in the Middle West. The success of these processes turns, therefore, upon local conditions. For this reason, W. J. Dibdin began to experiment on the possibility of a higher rate of filtration through coarser material, at the Barking outfall of the London sewage (1892). The material selected was coke breeze, and as the bed was no longer a filter plant but an oxidizing machine, it became necessary to secure filtration by making the beds water-tight. These so-called "contact beds" had their day at the beginning of the 20th century and the results were again variable. Zahn, at Charlottenburg, showed that brick, slag, coal, coke and gravel gave the best results, in the order named. Thumm, at Hamburg, showed that purification is increased by the use of material containing one per cent of iron (1902). Filters made of friable stuff lose their capacity. Due to clogging with solid material, contact beds retain their capacity better with septic effluent than with crude sewage, yet the chemical efficiency of the filter appears to increase with loss of capacity, i.e., with clogging. It was shown by Dunbar and Thumm at Hamburg (1902) that contact filtration is an alternation of aerobic and anerobic processes, starting with the settlement of solids in the sewage on to the surface of the brick or coke filter, with the absorption of the soluble constituents by the colloidal film of bacterial jelly covering these elements of the filter. During the aerobic (aeration) phase, the bacteria set up the ordinary nitrification of the intermittent filter, then the filter completes the liquefying process (hydrolysis) of the septic tank, reducing the nitrates to nitrites, with subsequent decomposition of the latter and liberation of free nitrogen. The "enharmonic" recontact purification as chemically ideal but bacteriologically unsound. The method is evidently an intermediate, experimental phase in the advancement of knowledge, for English opinion (Dibdin, 1903) is to the effect that preliminary treatment in the septic tank will prevent loss of capacity in the contact beds through choking with extraneous material.

Simultaneously with contact treatment, there was evolved a sixth method of purification by *continuous trickling* over large pebbles or similar coarse material, affording abundant aeration through the large interspaces. This process was already implicit in certain experiments with coarse gravel made by Mills (1890) and Hazen (1892) at the Lawrence Station, by Lowcock at Malvern (1891) and in G. E. Waring's device of purification over coke or broken stone by forced oxidation from below (1891-94); but purification by trickling with natural aeration was first described by F. W. Stoddart (1893), who exhibited a model of his method before the British Medical Association in 1891 and established the first working filter of this kind at Horfield (1899). The method was further developed by Corbett at Salford (1893), Ducat at Hendon (1897) and Scott-Moncrief at Ashstead (1898). Here the aerobic condition is constant, aeration being often five times the volume of sewage, so that nitrification seems to increase with the depth of the filter; but even distribution of the sewage is a difficulty which has necessitated such devices as tipping buckets, perforated pipes, sprays and sprinklers. As these methods of rapid puri-



Trickling Filters, with Imhoff Tanks in Background (Columbus, Ohio)

fication came into play, they gradually displaced chemical precipitation. Through the experiments of Dibdin at London and Sutton (1892-6), of Cameron at Exeter (1896), of Latham, Frankland and Perkins at Manchester (1898-9), of Hewson, Harington and Harding at Leeds (1897-1905), most of the other large English cities were strongly in favor of septic tanks with double contact beds or trickling filters; but with such

complex rules for operation that a fourth Royal Sewage Commission was appointed in 1898, with a view to simplification. Four sets of reports (1901-4) authorized the Local Government Board to substitute these methods in place of broad irrigation, wherever practicable. By 1904, Manchester, Sutton, Exeter, Yeovil, Barrhead, Oldham and Burnley were using septic tanks and contact filters, while trickling filters were in operation at Birmingham, Salford, Accrington and York. London and Glasgow remained constant to chemical precipitation. In Germany, elaborate experimentation at the Hygienic Institute of Hamburg (founded 1894) under W. T. Dunbar, at the Experiment Station at Grosslichterfelde under Schweder (1897-8) and at the Royal Testing Station for Water Supply and Sewage Disposal at Berlin (founded 1901) were uniformly against septic tanks and in favor of contact beds, with a more recent trend of opinion (Schury, 1905) in favor of trickling filters. The methods employed in all the German cities are set forth *seriatim* in the massive Sewage-Lexikon of Hermann Salomon (Jena, 1906-11). In France, experimental work upon biological and chemical purification at the Madeleine Station under Albert Calmette is recorded in eight elaborate reports (Paris, 1905-8). In the Dutch cities (Amsterdam, Rotterdam, Delft), the pneumatic pumping system devised by Liernur (1867), has been employed. In 1903, there were 23 intermittent filter areas in Massachusetts, while the septic tank was introduced at Urbana (1894) and Champaign (1895-7), Kewanee (1898) and Lake Forest (1902), Illinois, Fond du Lac, Madison (1901), and Wauwatosa, Wisconsin (1902), Mansfield, Ohio (1902), Saratoga, N. Y., (1905) and elsewhere. The only large trickling plant is at Madison (Winslow). Of 1524 American cities in 1905, 1100 had sewerage systems and 90 purification plants, viz., 14 irrigation areas, 13 chemical precipitation plants, 29 septic tanks, 41 intermittent sand filters and 10 trickling filters.

The latest development in the treatment and utilization of sewage is the *activated sludge process*, devised and developed by G. J. Fowler, at Manchester, England (1912),¹³ out of certain experiments on the aeration of sewage in tanks by Clarke and Gage at the Lawrence Experiment Station. The first exclusively activated sludge plant in this country was the testing station at Urbana, Illinois (1914), which was followed by a similar installation at San Marcos, Texas (1915), two large plants at Houston, Texas (1917) and the gigantic system of the Milwaukee Sewerage Commission (1913-24). Activated sludge treatment consists in preliminary filtration of the sewage to be treated through 1/8-1/16" grating; rapid sedimentation of sand in grit chambers; aëration by admixture with activated (aërated) sludge, by influx of compressed air through piping below (aëration tanks), or by the mechanical process of mixing by machinery; sedimentation of the sludge from this mixture in sedimentation tanks; re-aëration and re-sedimentation, if necessary; and subsequent use or sale of the

¹³ G. J. Fowler: Tr. xv. Internat. Cong. Hyg. & Demog. (1912), Wash., 1913, iv, 375-183.



Aeration Tanks at the North Side Plant at Houston, Texas

dried sludge as fertilizer or fuel. The process is usually effected in the rectangular or circular tanks devised by Carl Imhoff in 1906, and has been very extensively perfected in Germany, particularly in the system of open and closed canals with Imhoff tanks employed in the Emschertal. The Imhoff or Emscher tank consists of two deep settling basins, one above and inside the other, and combines the merits of the sedimentation tank and the sludge digestion tank, into which the settled sludge would ordinarily flow before the septic tank effect has set in. In the Imhoff tanks, the sedimentation chamber is built into the sloping sides of the upper part, with a slot in the bottom for evacuation of the solids into the sludge compartment below. The lower part is thus a septic tank. The slot is so constructed that one side overlaps the other, forming a trap to prevent the fermenting solids from reentering the sedimentation chamber. This ingenious system is now in use in many cities of England, Germany and the United States.

In an outline sketch of this brief compass, it would lead us too far to attempt more than a rapid survey of

the present status of sewage disposal and water-supply in modern cities, the basic material of which is often scrappy, disparate, inconclusive and widely dispersed in space and time. Two outstanding American systems are of particular interest, *viz.*, those of Chicago and New York.

In the early days (1833-37), Chicago got its water in the usual hand-to-mouth way, then in part through the Chicago Hydraulic Company (1840-51), then from Lake Michigan by water-works built by the city (1851-4), later by tunnels (completed 1867) extending from the intake cylinders at the bottom of the lake (enclosed in gigantic "cribs" loaded down with rocks) to the Central, Lake View, North Side, West Side, 14th Street and Hyde Park (68th Street) pumping stations, with reservoirs at Washington Heights. As the sewage and industrial wastes were emptied into the Chicago River and carried into the Lake, pollution of the water had become a nuisance even before 1870, and the Illinois and Michigan Canal (authorized, 1821, built 1836-48) proved inadequate to meet the difficulty. The street sewers were poor, the corner gutters were clogged with filth, which ran over into the streets and became massed under those which were planked, while the people drank their own sewage from the Lake. The great fire of October 8, 1871 destroyed most of the wooden structures and resulted in a new city of brick and stone. On July 1, 1889, Chicago and its suburbs was organized into a Sanitary District of 185 square miles for a population of 1,149,738. By 1925, this had expanded to 437.39 square miles, covering Chicago (199.38 square miles, population 3,350,000) and 49 other cities and villages. The New Drainage Canal, which reversed the flow of the Chicago River uphill from the Lake into the Desplaines River, was constructed in 1892-1900, with a system of intercepting sewers (1898) to prevent drainage of surplus sewage into the lake. Permission to open the Canal was granted by the Federal Government on May 9, 1899, with subsequent restrictions on the amount of Lake water with which the canal sewage was to be flushed. A bargeway, the Illinois and Mississippi or Hennepin Canal, was constructed about the same time (1892-1907) and opened on October 24, 1907. With the opening of the New Drainage Canal there was an immediate fall in the death rate and typhoid mortality rate in 1900, but an ominous rise in both during 1901-5. An extension of the main channel was effected in 1903 and in 1908-10, the North Shore channel, diverting North Side sewage from the Lake into the Chicago River, was constructed. The Lake Front Sewer (1913-16) and the Evanston Sewer (1916-20) diverted all lakeward flowing sewage of these districts into the North Shore Channel. The sewage of the Calumet district was diverted from the Lake by the Calumet Sag Channel (1912-22), which reversed the flow of Little Calumet River to the main channel at Sag, 22 miles southwest.¹⁴

¹⁴ R. W. Putnam: Mil. Surgeon, Wash., 1926, LVIII, 243-258.

On March 3, 1923, the Secretary of War authorized Chicago to withdraw 8500 cubic feet of Lake water per second to flush these drains, provided it installs a system of artificial sewage treatment adequate for 1,200,000 people at the expiration of the project. Experimental sewage-testing stations had been built and operated at 39th street, the stockyards, Arge and the North Side from 1908 to date, resulting in an arrangement of the Sanitary District into six divisions, for sewage treatment, viz., the Des Plaines River, Calumet (1915-23), North Side (1922-9), Industrial wastes, West and Southwest Side projects, including an activated sludge plant on the North Side below 12th Street, the largest in the world (180 acres). The water consumption (800 million gallons daily or 275 gallons per head *per diem*) is to be cut down by metering, which will reduce the volume of sewage, while the sewage will be treated by sedimentation in Imhoff tanks, batteries of concrete aeration tanks (24 each), trickling filters and the activated sludge process. The program will be completed in 1940, five years earlier than anticipated.

In colonial and post-revolutionary days, New York City water was drawn mainly from wells, streams and ponds now filled in. A system for drawing water from Collect Pond was installed by Christopher Colles (1738-1821) in 1774-6, but never used. The Manhattan Company, organized (1779) to supply the city with water, devoted itself mainly to the banking business. In 1829, the city built a reservoir at 13th Street, and in 1837-43, the Old Croton Aqueduct. The use of Croton water was suggested by DeWitt Clinton in 1830. Water from the Bronx River was introduced in 1854. The Bronx River Conduit (1880-85) and the New Croton Aqueduct (1884-93) were the main sources of additional supply before the introduction of Catskill water from Schoharie and Esopus Creeks. Water was brought in from the Byram River (Catskills) in 1896-8-9. After the organization of the new Water Supply Commission (1905), the supply from the two Croton Aqueducts and the Bronx River Conduit was 415 million gallons daily. The Catskill system comprises the great Ashokan Reservoir, 22 miles north of the city, with a capacity of 130½ billion gallons, storing water from the combined Schoharie and Esopus water-sheds; the Catskill Aqueduct (1905-17), 110 miles long, passing from the reservoir under the Hudson to the Kensico Storage Reservoir (White Plains), thence to a filtration plant near Scarsdale to the Hill View Reservoir (Yonkers), with a capacity of 900 millions, to be delivered thence to the five boroughs by an 18 mile tunnel through solid rock. A new tunnel, from Hill View Reservoir to Brooklyn was authorized on March 10, 1927. The other distribution reservoirs are the Central Park, Clove, High Bridge, Jerome Park, Mt. Prospect, Silver Lake, Williamsbridge, and three of the Ridgewood System, from the Central reservoir at Hempstead. The Kensico Dam across the Bronx River Valley is one of the largest in the world, rising 307 feet above the rocks on which it rests. The total supply from the 24 reservoirs (276,086 million gallons) is about 1000 million gallons daily, the consumption (1925) about 865 million gallons *per diem*. The sewerage of Manhat-

tan goes back to 1676, when a brook flowing through Broad Street was converted into an open sewer, which was still functioning when Waring reported on it in 1886.¹⁵ A network of drains, originally for swamp areas, spread out from this axis, and as the population increased, each street had its sewer of brick or stone, emptying into the North or East River. With the introduction of Croton Water, most of the sewers continued to empty into the old drains, which were not self-cleansing, nor adapted to the increased intake and were sometimes washed to pieces. In 1849, the construction and maintenance of New York sewers was taken over by the Croton Aqueduct Department. At this time, there were about 69.3 miles of sewers for a population of half a million. Construction now kept pace with the rapid growth of the city at the rate of about 12 miles of sewers per annum, so that by 1855, the total sewerage was over 140 miles. As the construction of new sewers, at the instance of land owners or of the city surveyor, was spontaneous, hap-hazard and sometimes worse than faulty, the greatest confusion reigned. Following the drastic reports of the Croton Aqueduct Board (1863-4), the sewerage act of 1865 was passed, authorizing the adoption of a general system for a population of 750,000. An organized corps of engineers made surveys and plotted the city into drainage areas, but with 200 miles of sewers on their hands, some of them unrecorded and in Carlyle's phrase, "tending nowither," nearly every street on the water-front had an outlet sewer, with consequent pollution and clogging of the river. With hundreds of old basins, new intercepting sewers were built. The first collecting sewer was built on the West Side at 11th Street in 1868, and the system was extended up to 17th Street by 1880. In 1865, sewers of strong vitrified piping from England and Scotland were substituted for brick structures. Much of this work had to be done through excavated rock at the rate of a cubic yard of rock for every foot of sewer. In 1870, the government of New York City was reorganized by charter, with a Department of Public Works controlling the sewerage (1871). At this time, there were many sunken lots below the level of the sewers, due to grading of streets by embankment above the ordinary level, and these became stagnant reservoirs of ordinary drainage and leakage from faulty sewers. By 1879, some 1391 land drains had to be constructed to carry off these accumulations. Meanwhile the enormous discharge of ordinary sewage continued to be a nuisance on the water-fronts. This combination of hap-hazard construction in chemical improvements and pollution of the three rivers went on through the dark days of the Tweed administration and later. During 1894-7, some improvements in street-cleaning were effected by Colonel George E. Waring (1833-98), at that time the American authority on sewage disposal. In consequence of two reports of the New York Bay Sewage Commission (1905-6), the Metropolitan Sewage Commission was appointed by the Legislature in 1906 and rendered three voluminous reports in 1910, 1912 and 1914. The sense of these reports

¹⁵ G. E. Waring: Report on the Social Statistics of Cities (U. S. Census), Washington, 1886, Part I, 568-587.

was that interference with the local sewerage systems was unnecessary but that the main drainage system should be modified by intercepting conduits collecting the local sewage and conveying it to central plants for treatment so that a pure effluent could be discharged into the harbor waters. By 1910, there were over 500 sewer outlets along the waterfronts and, according to Soper,¹⁶ the quantity emptied daily (600 million gallons) "would fill the East River at the Brooklyn Bridge for a distance of $\frac{1}{3}$ of a mile, while the sewage produced in the Metropolitan District alone would fill the Flatiron Building at 23rd Street every 43 minutes." Manhattan Island came to be described as "a body of land entirely surrounded by sewage." The detailed plans of the Metropolitan Commission, which were to be completed at the intervals 1916, 1920, 1925, 1930, at an estimated total cost of \$51,469,400, were opposed by the engineers of the Sewer Plan Commission, appointed by the Board of Estimate and Apportionment and ultimately merged with the Bureau of Public Improvement (1916). Acting upon a basis of agreement arrived at by the two Commissions, the Board of Public Improvement proposed to clean up the Harlem and East Rivers by intercepting the sewage, treating it in sedimentation plants and discharging it into the Hudson at a point north of the Spuyten Duyvil Bridge; by tunnelling it under Harlem River and 155th street; by screening or sedimentation at the end of 132nd street, with subsequent tunnelling to treatment plants at Ward's or Riker's Islands or Sunken Meadow, with other treatment plants on the lower East River side. The Report of the Public Health Committee of The New York Academy¹⁷ of Medicine (September, 1918), prepared by Dr. E. H. Lewinski-Corwin, discusses at length the points at which the Committee and the City Engineers were in agreement or disagreement and in view of the expensive character of the proposed layout (estimated at over \$50,000,000), recommends that the Board of Estimate and Apportionment adopt suitable plans to relieve the pollution of the harbor waters and make the proper appropriations for their execution. Beyond setting aside part of Wards Island for a sewage treatment plant, nothing further has been accomplished to date.

With the almost incredible growth of large cities before the World War and after, the improvement of sewerage and water-supply system became imperative, even in such tropical or semi-tropical centers as Alexandria (1905), Cairo (1910-25), Madras (1924), Constantinople (1915), and Peking (1911). Cities like Berlin, Cologne, München, Naples, Paris and Vienna, once disgraceful for bad smells and worse sanitation, now possess plants for sewage disposal and water-supply which are the admiration of Europe. They effected an astounding reduction in disease

¹⁶ G. A. Soper: *Tr. Am. Inst. Chem. Engineers*, N. Y., 1910, III, 364-373.

¹⁷ *Med. Rec.*, N. Y., 1918, XXIV, 502-506.

incidence and mortality rates from water-borne diseases. The Revolution of 1911 gave a new sewerage and water-supply system to Peking and similar improvements were undertaken everywhere after the World War. Only passing and tabulated reference can be made to the water-supply systems of such cities ¹⁸ as

BALTIMORE:

From Jones River and Great Gunpowder Falls (1807-54) by tunnel to 8 reservoirs; distribution by gravity (low service) and pumping (high service). Gunpowder Aqueduct (1875-81). New Dam at Loch Raven (capacity 2 billion gallons) and filtration plant at Montebello. New sewerage system over Fallsway (1905-16).

BERLIN:

Originally from wells. Stralau water-works constructed by Fox and Crampton (1856), purchased by the city (1874), displaced by supplies from Tegel Lake (opened September 23, 1877), with 21 sand filters, and Müggel Lake (1890-93), with 22 filters and 8 reservoirs at Lichtenberg. Experience of Hamburg with water-borne cholera led to adoption of Koch's rules, viz., 1. Rate of filtration never more than 4 inches per hour. 2. Daily bacteriological examination of each filtrate. 3. Rejection of any filtered water containing more than 100 bacteria per cubic centimeter. Encroachment of factories and dwellings led to abandonment of surface supply for subterranean. Tegel Lake now tapped by 118 tubular wells and Lake Müggel by 349 wells (1901-3).

BIRMINGHAM:

Originally from neighboring wells and rivers (20 million gallons). Plan of supply from watershed of Elan and Claerwen Rivers, Wales (1891-2). Radnorshire aqueduct, 74 miles long (1892-1904). New supply opened by King Edward VII, July 2, 1904, followed by construction of masonry dams forming two reservoirs in Elan River, with 30 filter-beds (27 million gallons in 1904). Three dams and reservoirs in Claerwen River will yield 75 million gallons.

BOMBAY:

From Vehar Lake made by damming the Garpur River, Tulsi Lake (1872), Pawai Lake (1890) and the Tansa Reservoir, formed by the Great Tansa Dam, 118 feet high (1891), enclosing a lake 8 square miles in area, supplying 33 million gallons daily. Formally opened by the Viceroy, Lord Landsdowne in 1892.

¹⁸ Valuable tabulations of the water-supplies of American and Canadian cities were made in the Manual of American Water-Works, Fourth Issue, New York, 1897, now unfortunately discontinued.

BOSTON:

From Jamaica Pond Aqueduct (1796-1893), Lake Cochituate (1845), Sudbury River (1878), Mystic Lake (1864-74) and South Branch of Nashua River (Metropolitan Water Board, 1895). Wachusett Lake Reservoir at Clinton (1896-1906) is the largest in the world (area 6.55 square miles; capacity 63 billion gallons).

BUFFALO:

By pumping from Niagara River (1852); new system with filtration plant (1926).

CALCUTTA:

From Hoogly River, 16 miles above city; iron reservoir, second largest in the world, just completed at Racla.

CINCINNATI:

By pumping from Ohio River (1820-96).

CLEVELAND:

By pumping from Lake Erie (1854-6); new filtration plant (1929).

DETROIT:

By pumping from Detroit River (1827); later an exceptionally pure supply from Lake St. Clair.

GLASGOW:

From Loch Katrine by aqueduct 35 miles long (1859), with subsequent raising of lake (1895), tunneling of Loch Arklet (1895) and building of the Loch Arklet dam (1909).

HONG KONG:

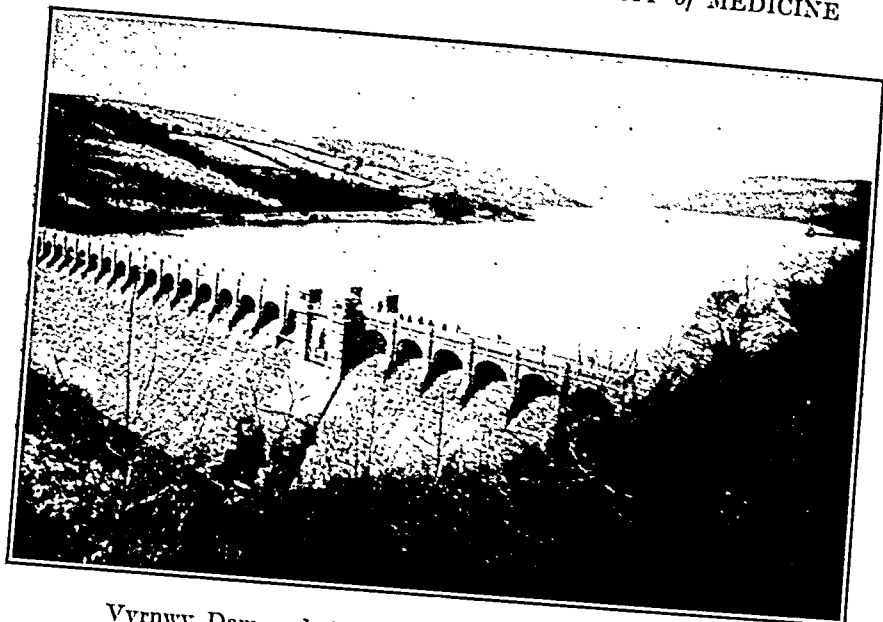
From rainfall by Pokfolum and Tytām reservoirs (total capacity 456 million gallons). Reservoirs now empty from recent drouth.

LENINGRAD:

From Neva by three water-works only one of which had sand filtration. Supply poor by reason of impurities gathered by floating ice. New plant for rapid filtration, clarification by aluminum sulphate and subsequent purification by 126 ozone batteries, with suction by Otto emulsors into 5 sterilization towers, built on site of old Penkowaya water-works by Siemens & Halske (1910-11). Tsarskoe Seloe supply from Gatschina-Taitzy Springs. Central Reservoir damaged by floods in 1924.

LIVERPOOL:

Originally from sandstone wells and works at Rivington (1847). Creation of Vyrnwy Lake, the largest reservoir in Europe (capacity 12 billion gallons), by impounding waters of Vyrnwy River (1880-92) by Vyrnwy Dam and subsequent tunneling of waters of Conwy and Merchant Rivers into this reservoir (opened by King George V, March, 1910).



Vyrnwy Dam and Aqueduct, Wales (Liverpool Supply)

LOS ANGELES:

By gravity from Crystal Springs 7 miles N. W. of city (1862-74). New supply from Owens River in the Sierra Nevada Mountains across Mohave Desert by an aqueduct 235 miles long (1913) a subterranean reservoir (Pacoima Dam) and 2654 miles of water-mains (1925).

MADRID:

From Lozoya Canal, 32 miles long. Additional reservoir (1883), construction of new water-works delayed by collapse of whole structure (April 8, 1905), with loss of 400 lives.

MANCHESTER:

From Irwell, Medlock, Irk and Tib Rivers (Longdendale Works, 1848-84). Increased supply by aqueduct from Lake Thirlmere (Cumberland), 96 miles away (1879-94), Haweswater scheme (1925-34) to comprise 84 miles of aqueducts, tunnels and pipes.

MANILA:

By gravity from Mariquina River into 2 billion gallon reservoir at Montalban (1908), 212 feet above sea level.

MARSEILLES:

From Durance River, opposite Pertuis, by Canal de Marseille (1837-48), 97 miles long, which crosses the Arc, between Aix and Roquefort, by the great aqueduct of Roquefavour, irrigates 7500 acres, purifies itself in the basins of Réaltourt and affords 2200 gallons per second for water-supply, sanitation and industrial works (2450 horse-power) to the city.

MELBOURNE:

From artificial Yan Yean Lake, 19 miles away.

MEXICO:

By Aztecs from springs at base of Chapultepec hill, with main causeway of city as dam. By Spaniards from three other springs by two long aqueducts. Later from other springs, the Rio Hondo (1899-1900) and 1386 artesian wells in the city.

MILAN:

From subsoil wells, 150 feet deep, using a tower of the Castello Sforzesco (Parco Nuovo) as a distributing center.

MILWAUKEE:

From Lake Michigan (1872-3) by pumping to reservoir and repumping to stand-pipes for high service.

MONTREAL:

By pumping from St. Lawrence River to reservoir and re-pumping to high service reservoir (1801-15). St. Cunegonde and other water-works taken over by Montreal Water and Power Company (1889-91).

MOSCOW:

From Mystishchi Springs and ponds to fountains in city (1893). Distributed by water-carriers.

NAPLES:

In 17th century from Isclero River by an aqueduct which now supplies city fountains only. After the cholera, epidemic of 1884, from a hillside torrent (probably, from an underground lake) near Avellino by a covered masonry canal and iron piping to five gigantic reservoirs opposite Capedimonte Palace, thence by gravity to the city. The supply, icy cold and very pure, displaced all the infected wells in the city, which were closed as each new stand-pipe was erected. The sewage, which once rendered the bay unfit for bathing, is now conveyed by tunnels through Posilipo hill over the plain, to discharge into the sea on the deserted coast of Cumæ, 17 miles distant.

NEW ORLEANS:

By pumping from Mississippi River (1833). New system (1905-9), with screening and subsequent removal of aerial cisterns (1905), filtration by mechanical precipitation and distribution by 661 miles of water-mains (1925).

PARIS: 19

In Roman times, from Sources du Midi, supplying thermæ at Cluny by aqueduct of Arceuil (360), revived by Henri IV and reopened under Louis XIII, May 18, 1624. From Sources du Midi by aqueducts of Pré Saint-Gervais and Belleville (1457). Pumping into city by Samari-

¹⁹ Diénert & Guellerd: *La Nature*, Paris, 1928, LI, 88; 108.

tan (1606), Notre Dame (1670), Chaillot (1781) and Gros Caillou (1781) pumps. Derivation of waters from Ourcq River (1782-1822) and artesian well in plains of Grenelle (1832). Program of Belgrand, (1854-1900), in connection with Baron Haussmann's improvements of streets, included:

A. Domestic supply from Seine basin, viz., Dhuis (1865) by 82 mile aqueduct to Menilmontant reservoir; Vanne (1868-74) by 108 mile aqueduct again crossing Arceuil by double bridge, to reservoir at Montsouris Park, to which also converges supply from springs at Loing and Lunain (1892-1900); Avre (1891-3) by 63 mile aqueduct to Montretont Reservoir (St. Cloud).

B. Public and industrial supply from pumping stations at St. Maur (1897) and Ivry (1899); from Ourcq Canal (1801-1822) and from artesian wells and old aqueduct of Arceuil. Distributed to city by high and low pressure. Work on new supply from springs in valleys of Seine, Marne and Aube in progress (1923-9) but interrupted by inundations of 1910 and the World War (1914-18).

PHILADELPHIA:

By pumping from Schuylkill and Delaware Rivers, with high service pumping from reservoir to stand-pipe (1799-1860). Water-borne infections checked by new filter-plant (1901-8).

PITTSBURG:

By pumping from Allegheny River (1826-78), with slow sand filtration plant.

RIO DE JANEIRO:

Formerly from small streams in the Sierra da Carioca by the old Carioca aqueduct, crossing the gap between Santa Thereza and Santo Antonio Hills by a bridge of double arches now used as a viaduct for the city tramway. Since 1885, from the Serra do Tinqua by the Rio de Ouro water-works, with 33 miles of iron mains between the collecting reservoir and the main distributing reservoir at Pedregulho.

SAINT LOUIS:

By pumping from Mississippi (1831), settling basins and conduit (1892) and chemical purifying plant (1904).

SAN FRANCISCO:

By gravity from mountain springs by single main (1856-74). After fire and earthquake by five independent systems. New Hetch-Hetchy system from headwaters of Tuolumne River in Sierra Nevada Mountains (1914-25). Dam and reservoir in Hetch-Hetchy Valley completed 1923. Tunnel (18 miles) to power-house at Moccasin Creek (1925). O'Shaughnessy Dam in Yosemite Valley (capacity 400 billion gallons daily) completed in 1929.

TOKYO:

From Tama River via Yodobashi reservoir.

VIENNA:

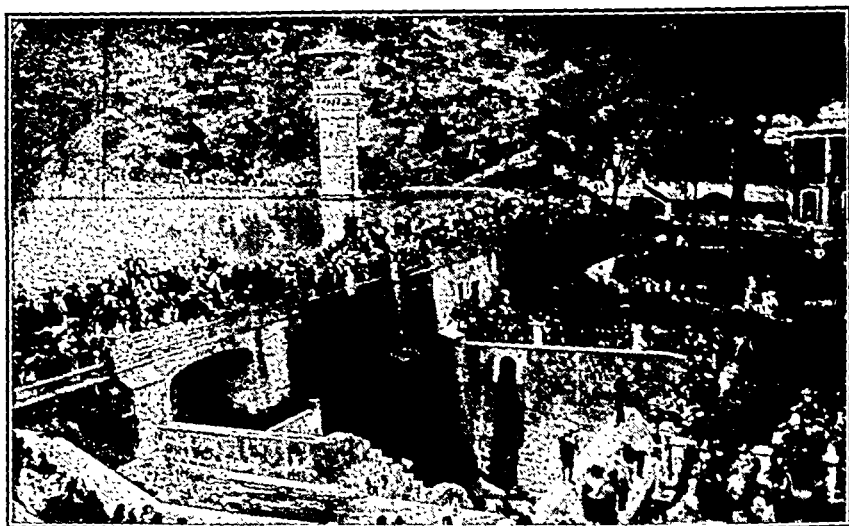
By Kaiserbrunn aqueduct direct from the Schneeberg (Alps), 56 miles away (1869-73). New sources tapped, 1891-3. New supply from Salza, 150 miles away (1902).

WASHINGTON:

From Potomac by aqueduct from Great Falls 12 miles long, spanning Cabin Johns Bridge. Constructed by U. S. Government (1853-1929). Sand filter (1896-1906). New system (180 billion gallons daily) nearly completed.

In attempting to drive a four-in-hand of themes of such vast scope, each of them coextensive with the story of man himself and none as yet provided with an adequate and sequential history, the difficulty is intensified by the intractable and evasive character of the material. Even such a slight performance as the present sketch had to be pieced together from scattered (or successfully buried) data of archæology and sanitary engineering, from guide-books, government reports, travel sketches, magazine articles and even world almanacs. While not a syllable about our quadrivium will be found in the average lengthy treatise on *Culturgeschichte*, the basic theme (domestication of water) is surely one of the most fundamental and picturesque conceivable, in the view of some thinkers, the starting point of civilization. The incredible irrigation tanks of Ceylon, the great Assyro-Babylonian drains and water-courses, the Aqua Claudia and the Cloaca Maxima, the Pont du Gard and Nadrai Aqueduct, the Queen Mary Reservoir and Vyrnwy Lake, the sewage farms outside Berlin and Paris, which furnish half their vegetables in season, such imposing massive walls of upreared masonry as the Vyrnwy, Tansa, Kensico, Elephant Butte and Shoshone Dams, or such feats of engineering as the Chicago Drainage Canal or the raising of Loch Katrine, are among the ways and works of man which Carlyle liked to herald as "legible through the solar system." About them hovers the dramatic element of moving accidents by flood and field, such as the capsizing of the Bousey Dam, the Johns-

town Flood, the break-up of the Madrid reservoir, the terrible inundations which have overwhelmed our Mississippi and Colorado areas—fatalistic and “fortuitous concurrences of physical forces,” which sweep away human settlements like ant-hills and dwarf man himself into insignificance. In keeping with the gravity and risks of such serious enterprises, the opening of aqueducts, reservoirs and drainage canals, like the christening of a battle-ship, is usually a matter of festal pomp and circumstance, from the days when the Lord Mayor of London rode to the conduit heads to the opening of the Queen Mary Reservoir by George V or the annual festivities attending the opening of the ornate lower dam at Guanajuato (Mexico) on St. John's Day (June 24), just before the rainy season, a veri-



Fiesta at the Lower Dam at Guanajuato (Mexico) on St. John's Day (June 24), before rainy season

table *Fiesta de la Presa*. Again, about all rivers there is the important legal question of riparian rights, with reference to the poisoning of streams by industrial or domestic sewage, as in the suits brought by Millbury, Mass. against

Worcester or by Missouri against Chicago, or the pending dispute between the states on the Ohio River and the question of Federal intervention, which turns upon the interpretation of a single word in our Constitution. About all still or flowing waters, too, there is the inevitable romantic aura, from the Song of Solomon to Swinburne's "weariest river," from the "pure river of water of life" (Revelations, xxii, 1) to Goethe's *Bächlein* or the *Schilflieder* of Lenau, from Mendelssohn's *Melusine* to such *jeux d'esprit* as *Au bord d'une source* (Liszt), *La Fontaine* (Henselt) or the *Barcarola* of Rachmaninoff. The opening of *Rheingold* is suggested by what Richard Wagner said to Edmond Schuré on the bridge at Basel: "*La nymphe exquise que cet eau—c'est traître et fuyant comme la vie!*" In one of the clairvoyant moods which he sometimes had, the sombre Pascal opined that "Rivers are but roads in motion" (*Les rivières sont des chemins qui marchent*). And it has not escaped the observation of poets that the sometimes tortuous course of a stream is not unlike the uncertain chances and mischances of human life, from youth to age—

"But the majestic river floated on,
 Out of the mist and hum of that low land,
 Into the frosty starlight and there moved,
 Rejoicing through the hush'd Chorasmian waste,

 Brimming and bright and large; then sands begin
 To hem his watery march, and dam his streams,
 And split his currents; that for many a league
 The shorn and parcell'd Oxus strains along
 Through beds of sand and matted rushy isles,
 Oxus, forgetting the bright speed he had
 In his high mountain cradle at Pamere,
 A foil'd circuitous wanderer."

As life is motion, there is, as the Spanish proverb observes, an element of uncertainty in all smooth, still, dammed up waters, which is apt to revenge itself upon mankind (*Del agua mansa me libre Dios!*). The loss of life entailed by the bursting of great dams and the overflow

of pent-up torrents is a subject of strictly hygienic interest, as much the concern of preventive medicine as of stress, strain and strength of materials. It bespeaks the overweening confidence of great nations in the days of their might, the hazards attending the immense proliferation of populations up to the saturation point which preludes decline, and how medicine is in touch with human activity on every side.

F. H. GARRISON.

ALLERGY AS ENCOUNTERED BY THE GENERAL PRACTITIONER

WM. W. DUKE
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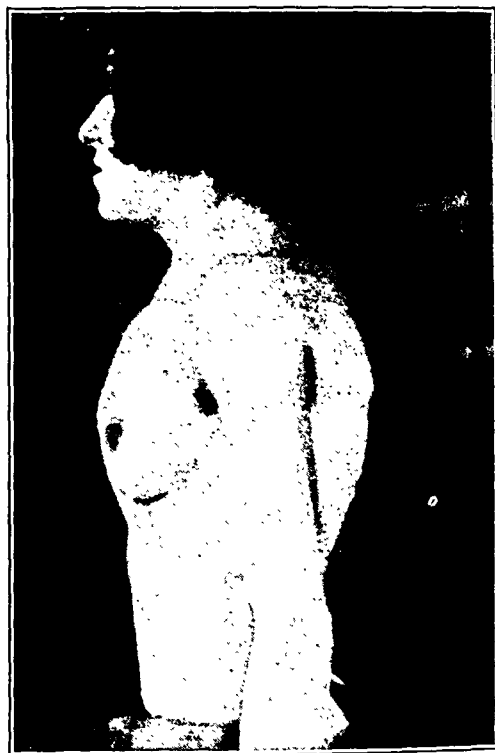
Delivered January 4, 1929, in the Friday Afternoon Lecture Series of The New York Academy of Medicine.

I understand that it is the wish of The New York Academy of Medicine to have presented in this lecture a survey of our knowledge of allergy as related to the general practice of medicine. Since this is my understanding of the object of the lecture, I shall confine my discussion to the practical points in allergy which can prove interesting to the general practitioner and shall avoid a discussion of theoretical points which are interesting to specialists, but which cannot at the present time be applied practically. I can assure you there remains an abundance of material which is both interesting and useful.

In 1910 Meltzer made the suggestion that bronchial asthma is a phenomenon of anaphylaxis. Regardless of the fact that the accuracy of this statement may be questioned, certain it is the suggestion has directed attention to an important class of diseases and a productive study has resulted. From recent investigations, we have learned to diagnose and treat illnesses which previously were overlooked or were not understood, or were not amenable to treatment.

It was observed by Magendie as early as 1839 that dogs which had been repeatedly injected with egg albumen often died suddenly. At a later period, Richet observed that animals injected with eel serum became sensitive to it so that second doses too small to be harmful to normal animals caused violent symptoms or death in the animals which had previously been inoculated. To this peculiar condition he gave the name anaphylaxis. In the earlier days of the development of this subject, we were inclined to believe that food idiosyncracies, pollen sensitiveness, and illnesses following serum injections were closely related to the condition produced in animals by second doses

of serum. This apparently is not a correct viewpoint, for we find it is very difficult to sensitize human beings by one or several injections of extraneous material. It led to the discovery of the fact, however, that in humans we have a hereditary condition in which a person spontaneously becomes sensitive to some alien substance and reacts violently upon intimate contact with it. For the recognition of the importance of heredity in the allergic consti-



FIGURES I-II—Typical chest deformity caused by perennial asthma in growing children. Note the increased anterior posterior diameter and marked dorsal kyphosis. This tendency is not pronounced in seasonal cases since the well period as a rule allows complete subsidence of the deformity. This deformity is also not so pronounced in individuals in whom the condition starts after the period of growth is complete.

tution and still more for the directing of the attention of physicians to the reality and importance of this class of diseases, we should feel grateful for the researches of Drs. Coca, Cooke, Vander Veer and their associates. Also for the early writings and investigations of Vaughan, Koessler, Walker, Rackemann, Lawdermelk and others.



FIGURES III-IV—The troubled face of the chronic asthma patient in youth and after the condition has persisted into adult life. Note the paranasal depression in both illustrations. This is a frequent finding in perennial cases which start during the period of growth and development. It is caused, I believe, by oedema in the paranasal tissues which impair their normal development. This deformity is not pronounced in seasonal cases. The well period apparently allows time for recovery of the tissues. It is not pronounced in individuals in whom the condition starts after development is complete.

Extreme Degree of Sensitiveness—The extreme degree to which this type of sensitiveness can develop is almost beyond belief. It can be so extreme that a common wholesome food stuff such as egg may come to rank in a sensitive patient with the poison of a venomous reptile in its capacity for causing illness—in fact, I know of few poisons comparable with an allergen in a highly sensitive case except diptheria toxin and tetanus toxin. Fortunately, sensitiveness of this extreme grade is uncommon. Sensitiveness in milder grade is common. I can easily illustrate high grade sensitiveness by stating that I have had three egg sensitive cases who could be made ill by eating the trace of egg in hen meat. They could tolerate rooster meat with impunity. It is well known that certain infants are made ill by mother's milk and that the illness can be traced to certain foods eaten by the mother to which the infant reacts. If these foods are eliminated from the mother's diet, the milk may agree with the infant. I have observed a number of patients who could be made violently ill by as little as one drop of honey. It can be readily understood that the substance which made them ill must have been ridiculously minute in amount for it is a known fact that if the sugar is removed from honey by dialysis and water by evaporation, practically nothing remains. I might finally illustrate high grade sensitiveness by citing the fact that I have observed three individuals who were sensitive to egg and suffered from eczema, asthma, or both upon contact with egg. Each of these three patients were relieved completely when egg was removed both from their diet and removed from the house in which they lived. In each case recurring attacks of eczema or asthma or both could be traced to the fact that egg was carried to the patients by individuals who had recently eaten egg. It is actually a fact that a mother's kiss can be violently poisonous to an egg sensitive infant if the mother has recently eaten egg.

Origin of Sensitiveness—Two factors seem important in the origin of sensitiveness to foreign matter. One is a peculiar hereditary constitution which permits an indi-

vidual to become sensitive to foreign matter. The other, peculiarity of exposure. Patients apparently become sensitive to materials which they meet with in traces rather than to materials which they encounter grossly. For example, it is uncommon to find a patient sensitive to milk casein. They are more likely to become sensitive to a substance contained in milk in infinitesimal amounts. They are more likely to become sensitive to the pollen of the air which they encounter in traces than to materials of diet which they encounter grossly. The fact is, that if a person were sensitive to something which he encountered in gross amounts at daily intervals, he should either die from gross exposure to the substance or gain tolerance for it.

Duration of Sensitiveness—Sensitiveness, once acquired, is likely to be permanent. This is more true of sensitiveness to air carried substances than it is in the case of sensitiveness to foods. This latter condition is probably due to the fact that in the case of food sensitiveness, a person often reacts to a split product of a food rather than to the food as it exists in nature. If digestive processes change so that certain products are not elaborated or not absorbed, we might explain theoretically why a patient should cease reacting to a food which at one time apparently caused illness.

Specificity of Sensitiveness—Sensitiveness in humans is frequently highly specific. For example, individuals sensitive to foods such as strawberries, or cantaloupe may react to the product grown in one locality and may tolerate the product grown in another locality. This apparent high grade specificity is not difficult to account for when we realize there exists differences in flavor of foods grown in different areas. Foods grown in certain areas certainly must contain chemical bodies which do not exist in the same food grown in another locality.

Multiple Sensitiveness—Certain individuals are sensitive to one agent only. The majority are sensitive to more than one. Patients sensitive to pollen may also be sensi-

tive to a food or animal dandruff or may also be sensitive to physical agents such as heat or cold or light or scratches. Whereas, multiple sensitiveness is a recognized condition, some patients who apparently react to almost everything, are often found sensitive to one or several agents which have a wide distribution in nature.

AGENTS WHICH TEND TO SENSITIZE

Pollen—Pollen is probably the most common single cause of sensitiveness in human beings. A patient who is sensitive to pollen reacts, as a rule, to the pollen which is found most abundantly in the air of the district in which he resides. Three classes of pollen are important. The pollen of the trees, which may give rise to spring cases of so-called hayfever, asthma, or dermatitis; the grasses which may give rise to summer cases; and the weeds which may give rise to fall cases. Flowering plants are relatively unimportant in the causation of reactions because of the fact that the pollen of flowering plants is not produced in large quantities. It also has a tendency to adhere to the plants from which it is produced. The pollen of flowering plants is carried from plant to plant by insects

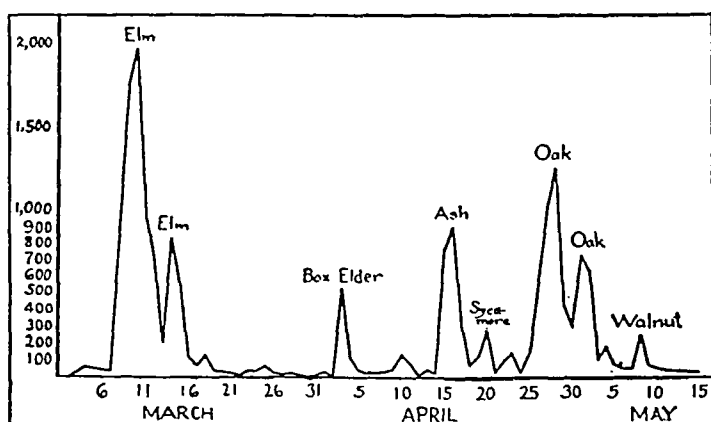


FIGURE V—Tree Season, 1927—The pollen content of the air during the tree season 1927. Note the peaks caused by pollenation of the different trees. These peaks usually appear on bright windy days. Wide spread rain usually filters pollen out of the air so that after a rain we often find a sharp drop.

rather than by wind. Very few individuals are actually made ill by the pollen of a flowering plant. They are occasionally made ill, by emanations from the leaves or petals of flowering plants

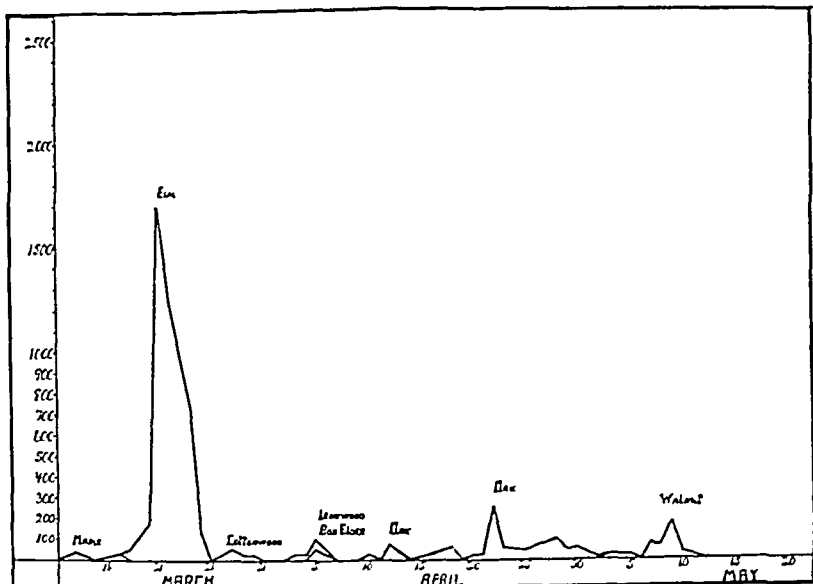


FIGURE VI—The Tree Season, 1929—Note the difference between Figure V and Figure VI. The pollination of the trees in 1929 was stopped by frequent slight spring frosts.

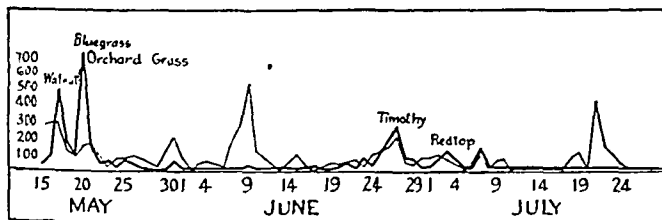


FIGURE VII—Grass and Spore Season 1927. Note the peaks caused by the various grasses. The thin line represents the spore count. The relationship between spores and summer symptoms has not been adequately studied. From the magnitude of the spore counts, one would imagine that it would bear an important relationship to summer symptoms.

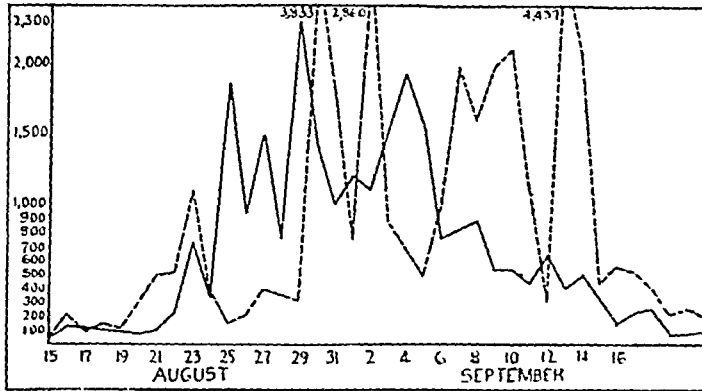


FIGURE VIII—Ragweed Season 1926 and 1927. Note how long is the season as compared with that of any individual tree or grass season. There is less variation in the intensity of the season in different years as compared with the tree season due to the fact that pollination is not so frequently impaired by frosts.

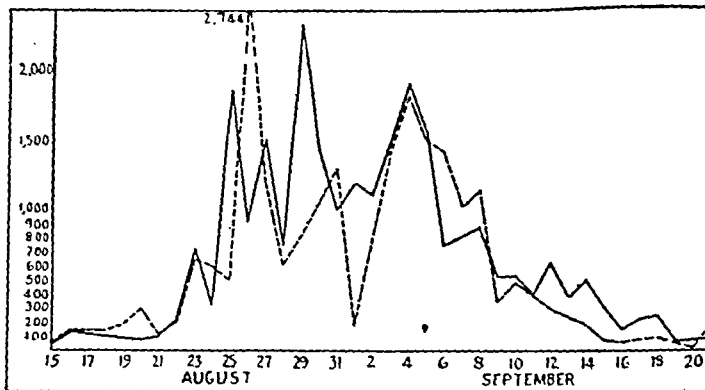


FIGURE IX—Ragweed Season 1927. Comparison of counts made in suburbs (solid line) and in the downtown district (broken line). This chart illustrates the fact that the proximity of weed patches does not make the gross difference in the pollen content of the air which one would expect. The fact is, that on windy days pollen is picked up from areas of a hundred miles or more. The additional pollen picked up from neighboring weed patches does not make the gross difference in the counts which one would expect.

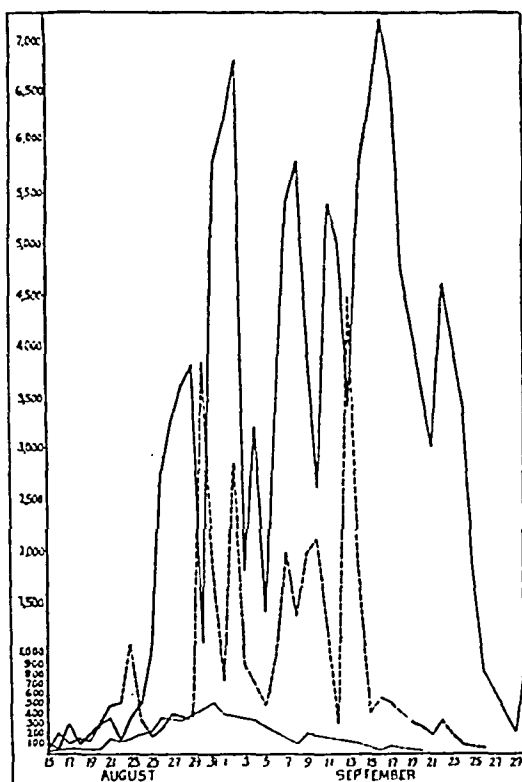


FIGURE X—Charts showing the gross variation in the pollen content of the air of different geographical districts. Solid line—Oklahoma City. Dotted line—Kansas City. Fine dotted line—Chicago. Counts made in sea coast districts such as New York, Richmond, Virginia, Oakland, California, are much lower on an average even than in Chicago and are small, indeed, as compared with inland cities such as Kansas City, Indianapolis, and Oklahoma City. This is due, no doubt, to the fact that in inland cities, the air has a sweep of wider areas covered with pollenating plants.

A study of the pollen content of the air yields extremely interesting information which explains the peculiar behavior of many individuals. Pollen does not constantly fill the air during the spring, summer, or even the fall months as we previously presumed, but fills the air for shorter periods of time and then nearly disappears. In Figure V to X, is shown the pollen content of the air observed at daily intervals in Kansas City during a period of one year. It can be observed that in March we have a peak of pollen production occurring coincident with the blossoming of elm trees. Other peaks occurring at later dates are coincident with the blossoming of box elder, ash, sycamore, oak, and walnut. Air pollens can be identified by comparing the pollen found on pollen plates with pollen collected from plants blooming abundantly at the time. Peaks of this sort are inclined to appear on sunny windy days. The pollen may disappear from the air almost completely with wide spread rain. During the summer months, peaks occur coincident with the pollination of blue grass, orchard grass, timothy, and red top, and during the fall months coincident with the pollination of the ragweeds. There is an interesting series of peaks during the summer months in Kansas City caused by so-called spores which are shown in Figure VII.

The spores found in the air in the middle of July could be identified with wheat rust and several patients who had hayfever at that time gave positive skin tests upon intracutaneous injection of a suspension of the spores of wheat rust.

Attacks of hayfever or asthma and, much less commonly, eczema, occur coincidently with the appearance of these peaks of pollen production. As a rule, testing with the pollen which is found in the air at the time the patient is having symptoms gives positive reactions and enables one to make a positive diagnosis as to the cause of the trouble.

It has been found in my cases that a rather large number of patients give seasonal reactions with symptoms such

as coryza and asthma at times when there is no pollen in the air. Furthermore, they are not found sensitive to pollen when tested. Cases of this type frequently are found sensitive to heat or cold and react to certain temperature changes. These will be referred to again subsequently.

It is common to find patients who have pollen hayfever who do not have pollen asthma. The reverse findings are unusual—that is pollen asthma in the absence of hayfever. It is believed that this is caused by the fact that the nasal membranes filter off a certain proportion of the pollen granules before it reaches the bronchial membranes so that the nasal membranes are, as a rule, more intensely exposed. Very frequently, when the pollen content of the air is very high, patients who ordinarily have hayfever alone will have, for a time, both hayfever and asthma. Pollen dermatoses are rare, but interesting when found. They can be diagnosed and treated with the same success as hayfever and asthma. Tests should be made by the application of pollen itself to the skin. This may give rise after a period of twenty-four hours to eczema similar to that of which the patient complains. We rarely find the striking hive reaction observed in hayfever and asthma cases.

The pollen content of the air does not vary as grossly in different neighborhood localities as one would expect. The pollen content of the air observed simultaneously by Durham in the suburbs of the city and by myself at my office in the heart of the city were almost identical on windy days. Pollen gets into the air in much the same way that dust gets into the air on windy days in dry regions. It is carried to great heights and for great distances. There may be little difference in the pollen content of the air near the ground and the air at the top of the highest buildings—in fact, in aeroplane studies which I made last year we found the pollen content of the air at a height of three thousand feet practically as great as the pollen content of the air near the ground.

There is a gross difference in the pollen content of the air in different geographical localities. In inland cities, such as Kansas City, the pollen content of the air is enormous. In a seacoast city, such as New York and Richmond, Virginia, or Oakland, California, it is very small. The air from the sea contains no pollen and the pollen of the air from the west which reaches the Atlantic coast is frequently filtered out of the air by rain in the Allegheny Mountains. Consequently, the pollen which reaches New York City comes from a relatively small district and does not reach the heights observed in middle west cities. Vaughan's counts made in Richmond, Virginia, and Rowe's counts made in Oakland, California, are scarcely ten per cent as great as those found in Kansas City, whereas, Durham's counts made in Indianapolis and mine made in Kansas City are almost identical.

I previously mentioned wind as an important factor in the carrying of pollen. This factor is so important that patients afflicted with severe symptoms of pollen disease may be violently ill on a windy bright day whereas on a still day following a rain they may be almost completely relieved. I found that the pollen content of the air in a closed room is practically nil as compared to the pollen content of the outside air. Pollen falls quickly to the floor in a closed room. This makes an ideal place, therefore, for the treatment of a pollen sufferer. Conversely, the amount of pollen deposited upon pollen plates behind the propeller of an aeroplane is perfectly stupendous. More is deposited within thirty seconds than is deposited by still air in twenty-four hours. These facts account for the apparently erratic behavior of patients with pollen disease. Those who are highly sensitive may be relatively free of symptoms if they remain indoors and on the same day may have severe attacks if exposed to air in motion. A railroad trip is always hard on a pollen sufferer on days when the pollen content of the air is high.

Whereas pollen is the greatest single cause of allergic reactions, other agents are also important.

FIGURE XI—Pollen Content of Still Air

Room closed 1½ years.....	0
Room closed 1 day (closed only 1 day).....	3
Room closed 1 day with fan going 12 hours....	8
Ventilated room, same day.....	20
Outside air count, same day.....	191

FIGURE XI—Pollen Content of Still Air. A comparison of pollen counts (twenty-four hour exposures) made from a room closed one year; a room closed one day; a similar room closed for one day with air kept in motion twelve hours by a fan; a similar room ventilated by a window opened to the extent of six inches; and finally from the outside air. Note the gross and rapid reduction in the pollen content of the air caused by the prevention of air movements. Pollen falls quickly to the floor if the air in the room is still, so that after a few hours the air in a closed room is almost free of pollen. A fan carefully used need not stir up much pollen in a closed room. A closed room makes a good refuge for pollen sensitive individuals on days when the pollen content of the outside air is high.

FIGURE XII

TABLE 3.—Pollen Counts *

Ground aviation field (calculated).....	0.6
Airplane propeller moving about half speed.....	82.0
Airplane rising to 200 feet, propeller full speed..	289.0
Airplane at 400 feet, propeller full speed.....	335.0
Airplane at 600 feet, propeller full speed.....	328.0
Airplane at 1,100 feet, propeller full speed.....	319.0
Airplane at 1,600 feet, propeller full speed.....	341.0
Airplane at 3,000 feet, propeller full speed.....	329.0
Airplane at 4,000 feet, propeller full speed.....	10.0
Airplane at 5,000 feet, propeller full speed.....	0.0
Airplane at 6,000 feet, propeller full speed.....	0.0
Airplane at 7,000 feet, propeller full speed.....	0.0
Airplane at 8,000 feet, propeller full speed.....	0.0

FIGURE XII—The Pollen Content of Rapidly Moving Air.—This chart represents counts made from pollen plates exposed thirty seconds to the air on the ground at an aviation field; behind the propeller of the aeroplane moving at half speed; behind the propeller moving at full speed; and behind the propeller at different heights from the ground. Note the small number of pollen granules deposited by the relatively still outside air as compared with the rapidly moving air behind the propeller of an aeroplane. Note also the fact that the pollen content of the air at the height of 3,000 feet is not grossly different from that at the height of 200 feet. One can infer that a rapidly moving train or automobile is a poor place for a pollen sufferer to be on days when the pollen content of the air is high.

Feathers and Hair—A certain small proportion of individuals are sensitive to hair or feathers and may react upon adequate exposure to certain animals. Patients of this sort are usually more sensitive to the animals than they are to the renovated fur or feathers. This type of reaction is important in individuals whose occupation brings them in intimate contact with animals to which they are sensitive.

Smoke—Smoke is a very definite cause of reaction in a very large number of cases. Patients can be just as specifically sensitive to certain types of smoke as they can be to certain types of pollen. For example, certain sensitive patients react to wood smoke, others to coal smoke, others to tobacco smoke. One patient I had was so sensitive to cigar smoke that the amount carried home on the clothes of her husband would cause her to have asthma. She could tolerate cigarette smoke. One patient sensitive to wood smoke was so highly sensitive that she could not remain many minutes in a room with an open fire place without having asthma. She had asthma regardless of whether a fire was burning or not. A scratch test with a solution of wood smoke gave such a violent reaction that adrenalin had to be given immediately for her relief.

Dust—Coca, Cooke, and associates have added a great deal to our practical knowledge from a study of dust as a specific cause of hayfever and asthma. They are able to extract substances from dust with which they can obtain positive skin tests and with which they can obtain good results in therapy.

Foods—Foods are a very definite source of hayfever, asthma, dermatoses, and gastro-intestinal upsets, especially in children. By far the commonest offenders are milk, eggs, and wheat. I have found pork to be a source of perennial symptoms in a small number of patients caused by daily contact with lard or bacon grease. Patients of this sort commonly give a history of asthma upon exposure to the fumes of frying grease and since food cases

very commonly give negative skin tests, this history is important in the diagnosis of pork sensitiveness.

Drug Idiosyncracies—It has been known for centuries that certain individuals are sensitive to drugs and react with symptoms which are similar in many respects to those of food idiosyncracies. Common types of sensitiveness of this variety are those caused by the salicylates, iodides, arsenical drugs, drugs of the atropine series, cocaine series, the morphine series, and the quinine series. Patients may become so sensitive to a drug that it is actually dangerous to use it in even minute amounts. A number of dentists have severe dermatitis from their infinitesimal exposure to the anesthetic which they use in nerve block.

Bacteria—It was formerly believed that bacteria were common sources of sensitiveness and gave rise to symptoms similar to those observed in pollen disease and in the food idiosyncracies. Most individuals are sensitive to certain bacteria in the same sense that tuberculous patients are sensitive to tubercle bacilli. However, I do not believe that bacteria give rise to the stormy symptoms characteristic of pollen disease except occasionally in the acute infections such as acute tonsillitis and rheumatic fever and scarlet fever. This view, however, is not shared by many observers who believe that bacteria are a common source of allergic coryza, bronchial asthma, and urticaria. Upon purely theoretical grounds one would believe that if an individual was sensitive to bacteria growing in his tissues, that constant intimate exposure would make him immune and that he would soon cease to react. This question, however, must be considered an open one at the present time. It has been extensively studied by Thomas to whose writings the readers are referred.

Insects and Animal Parasites—Insects such as mosquitoes, bees, bed bugs, etc., and animal parasites, such as round worms, may give rise to violent allergic symptoms. I know of one case of death which immediately followed the sting of a wasp. I have known of many cases who were so sensitive to certain insects, that they were made

profoundly ill by one or several bites. I observed one case of allergic shock which followed three insect bites and which would almost certainly have terminated fatally had it not been for the timely use of large quantities of adrenalin.

Therapeutic Sera—In a review of about eighty cases of death following a serum injection, Lamson found a history of hayfever or asthma in about half the cases. A first dose of foreign serum may cause a violent or fatal illness in patients who give a history of asthma, hayfever, or hives. It is advisable before administering serum to inquire for a history of hayfever, asthma, or hives, and in case a positive history is found either in the patient or his family, to make conjunctival tests with the serum before it is administered. In case of a positive test, it is urgent to avoid the use of serum unless an emergency such as proven diptheria justifies taking a gross chance of causing a serum death. Even with the finding of a negative conjunctival reaction, it is well to avoid the use of serum in hayfever and asthma patients unless it is definitely indicated. It should then be used in doses which are the smallest possible compatible with a good therapeutic result.

Blood Transfusion—I have had two cases of severe allergic shock occur during the course of blood transfusion in patients with a history of asthma. Both were relieved by the timely use of adrenalin, but one nearly resulted fatally in spite of this. Since these experiences, I have avoided transfusion in patients who give a history of hayfever or asthma. I would not hesitate to use transfusion, however, in an asthma case if the indications for transfusion justified taking a chance. The blood of patients and donors was compatible so far as iso-agglutinins were concerned in my two cases which were shocked. I attributed shock to sensitiveness of the patient to a food recently eaten by the donor.

Sensitiveness of One Individual to Another—This is usually attributable to some perfume or cosmetic worn

by an individual. A case was observed, however, by Dr. Manchester and one by myself of sensitiveness of an infant to the mother's menstrual secretion.

Endogenous Allergy—One wonders whether or not certain individuals might not become sensitive to some substances originating in their own body. I have had several cases of hives and angioneurotic oedema occurring in lactating women which could be relieved by a breast pump and which disappeared after lactation ceased. Also in several cases sensitive to light or cold, I wondered whether or not the individual could be sensitive to some new product formed in his own skin under the influence of light or cold. I have been unable to prove or disprove this point satisfactorily.

CONTRIBUTORY CAUSES OF REACTION

Many factors, such as mechanical agents, chemical irritants, light, heat, and cold, and the heat caused by functional activity can add to symptoms occurring as a result of sensitiveness to some other agent. It is a question with me, however, whether these factors are actually contributory causes of reaction or whether the patient is not specifically sensitive to the mechanical agent, or chemical irritant, or to light or cold or heat as the case may be, so that the two agents, acting simultaneously, elicit symptoms which are more severe than that produced by either one acting alone. A decision concerning this important point must be left for future work.

We know, furthermore, that reflexes, emotional disturbances, pregnancy, and lactation, defects in the endocrine secretions, nasal defects, and diseases in the alimentary tract may either cause or add to symptoms which are similar in many respects to that of typical allergy caused by foods or pollens. Occasionally lesions such as these seem to be primary causative factors of symptoms like allergic coryza or asthma. This type of case is also worthy of further study.

SYMPTOMS

Symptoms which can occur as a reaction of allergy are widespread. In fact, we might expect it to be possible for reactions to occur in almost any active tissue in the body.

Shock—Shock is the most tragic of all our symptoms. It is, fortunately, not extremely common. With the onset of shock, the patient usually complains of generalized itching, followed within a few moments by pain in the head or lower back, sneezing, cough, and within a few moments may totally collapse and appear breathless and pulseless. A severe reaction of this kind is usually associated with generalized erythema, frequently urticaria, frequently oedema, and frequently severe asthma. Under appropriate treatment with adrenalin the symptoms should reduce in severity or disappear within several minutes to thirty minutes.

Orbital Symptoms—Puffiness and itching of the lids, oedema of the conjunctivae, clear lacrimal secretion.

Nasal Symptoms—Sneezing, pale swelling of the membranes, clear watery or clear mucous secretion.

Pharyngeal and Oral Symptoms—Itching and oedema, especially of the soft palate and the pharynx.

Laryngeal Symptoms—Cough, hoarseness, pale oedema of the larynx and epiglottis.

Bronchial Symptoms—Cough, wheezing, bronchial obstruction, expectoration of clear watery or mucoid sputum.

Gastro-Intestinal Symptoms—Abdominal pain, nausea, vomiting, diarrhoea, mucous colitis.

Cutaneous Symptoms—Pruritis, erythema, urticaria, angioneurotic oedema, and dermatitis of many types.

Headache—Occurs as a primary symptom of reaction or may occur as a result of oedema in the nasal sinuses.

Neurological Symptoms—Asthenia is common. More rarely we find parasthesia, anesthesia, and in very rare instances, convulsions or temporary paralysis or mental disturbances.

Dizziness and Ménière's Syndrome—Can apparently occur as a result of reaction in individuals who may have no demonstrable disease in the internal ear.



FIGURE XIII—Egg eczema in an infant who had for several months been kept on a strictly egg free diet. This little child was completely clear of eczema within one week after egg was removed both from the diet and from the house in which he resided. Simultaneously he began to grow and gain weight with great rapidity. Recurrences of eczema were traced to the fact that the parents would occasionally eat egg while away from home and soon after handle the baby. This would invariably cause a recurrence. Tested experimentally by having the mother handle egg with her hands and soon thereafter touch the baby, we found smears of eczema on skin areas which had been in contact with the mother's hand.

Urological Symptoms—Renal colic and irritable bladder.

Miscellaneous Symptoms—Disturbances in menstruation, arthritis, hypotension, and eosinophilia.

Infection—May be superimposed upon tissues reacting as above mentioned and may complicate the clinical picture.



FIGURE XIV—Shows the same child after it had been rid of egg eczema by its avoidance for a period of several years.

SPECIFIC DIAGNOSIS

It has become a custom to place too much dependence and too much reliance in the results of skin tests in the diagnosis of allergy. The fact is that a careful family history, personal history, observations made by the patient in relation to the contact with or avoidance of certain articles, and actual practical testing by avoidance and contact with certain articles rank in importance, if they

do not exceed in importance, the results which can be obtained by skin tests. Unfortunately, skin tests are often positive for agents to which the patients do not react clinically and vice versa, agents which actually afflict the patient may give negative skin tests. The most reliable results to be obtained through the use of skin tests are with agents with which the patient comes in contact through the outside air—that is, pollens, animal hair, dust, etc. Skin tests with foods are usually disappointing.

Skin tests can be made in many ways and frequently it is advisable to make tests in several different ways. The intracutaneous tests should not be used by inexperi-

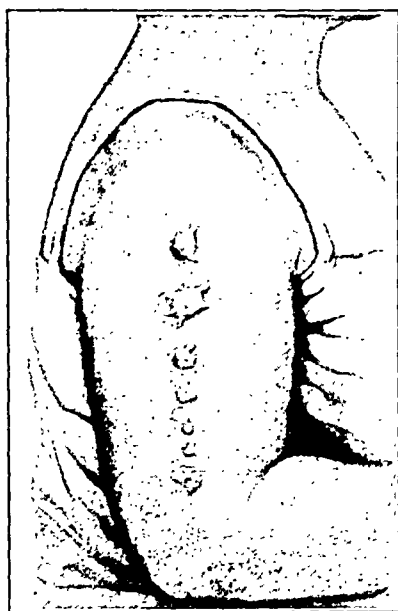


FIGURE XV—Illustration of series of tests with different materials in an individual suffering from pollen hayfever. The offender can frequently be discovered through observing the intensity of the tests. This means of diagnosis is subject to gross error unless one realizes that skin sensitiveness does not indicate clinical sensitiveness, and vice versa, patients who are clinically sensitive do not always give positive skin tests to the agents responsible for the trouble.

enced men. Scratch tests or tests made by the application of substances to the unbroken skin are more useful in some types of illnesses, especially in the case of dermatitis. They are also easier to use in children. Tests made by spraying solutions into the eyes or nose are very useful in confirming tests made in other ways. This is also true of inhalation tests and subcutaneous tests. It hardly seems advisable to dwell upon this large subject in detail.

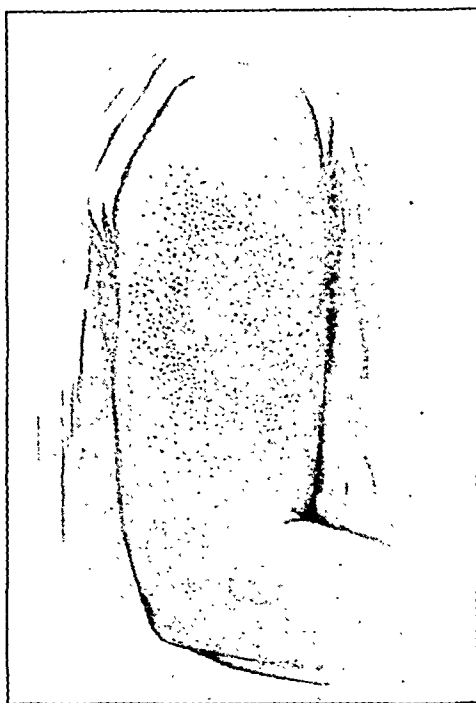


FIGURE XVI—Illustrations of a pollen test in an individual who had pollen eczema. Intracutaneous tests in this case were not striking, in fact were overlooked. The tests shown in the photograph were made by applying the bulb of the weed responsible for the trouble to the patient's arm. No reaction appeared for a number of hours. The illustration represents the condition observed after a period of twenty-four hours. The large eczematous area was caused, I believe, by contact between the skin and the pollen granules deposited upon it. The small eczematous areas later fused to make a large weeping surface exactly similar to that of which the patient complained when originally observed.

TREATMENT

The treatment of patients sensitive to foreign agents is often brilliant if the source of the trouble can be discovered. Avoidance of the cause is best if this can be accomplished and frequently gives rise to a brilliant rapid result. Frequently, however, the cause is difficult to avoid if it happens to be a common pollen or a common food. In this case, we have several ways of increasing tolerance for the noxious agent. It hardly comes within the scope of this article to discuss this large subject in detail. The results of this method of treatment are frequently brilliant and safe if carried out by experienced physicians.

We frequently encounter serious problems in the case of a substance found so universally in the cities as coal smoke. Individuals sensitive to coal smoke may have violent attacks in the environment of factories or railroads and can frequently relieve themselves by keeping away from such environments.

If the cause of the disorder cannot be found or, if when found, cannot be removed, we are frequently justified in giving what is known as non-specific "protein" treatment. For this purpose, peptone, typhoid bacilli, colon bacilli, milk, and other agents have been used.

SYMPTOMATIC REMEDIES

Adrenalin—The use of symptomatic remedies is important. Adrenalin, if adequately administered, should give relief in uncomplicated cases. It is a good practice to give about one-quarter c.c. or less subcutaneously at five minute intervals until tremor appears. This usually means that an adequate administration has been given and that relief should follow. After the dose which is most useful for the patient has been discovered, it can be repeated as symptoms tend to recur. It is advisable to give adrenalin in the incipency of an attack rather than wait until the height of the attack is reached. Adrenalin can be given repeatedly, if the dosage is correct, for months or years without much apparent ill effect.

If one wishes a more rapid effect from adrenalin in an extreme emergency, it is advisable to give it intravenously or give a given total amount, say one-half or one c.c. in five or six places intracutaneously. Both of these methods give a very quick result. The intravenous method is probably the more rapidly effective and the multiple injection probably the more useful except in extreme emergency.

Pituitrin—Pituitrin has an effect that is somewhat similar to adrenalin except that relief does not appear so promptly. Relief so obtained lasts longer. It is useful alone or in combination with adrenalin.

Ephedrine—Ephedrine, given preferably in solution, has an effect similar to that of adrenalin except that the result does not appear so promptly but lasts longer. Very frequently constitutional symptoms are disagreeable and should be avoided if possible through reducing the dose to the smallest which will give a therapeutic result. Many patients are unable to tolerate ephedrine and many do not get a good therapeutic result from it.

Atropine—Drugs of the atropine series are time honored remedies in the treatment of asthma. They can be given subcutaneously or by mouth. Sometimes as little as 1/200 or 1/500 grain three times a day is effective.

Iodides—This is a useful remedy, especially in older patients. The best dosage varies from a few drops to twenty-five or even fifty drops three times a day. Optimum dosage varies in different individuals.

Salicylates—Salicylates are very useful in treatment of nasal and bronchial reactions given in doses of approximately ten grains every three or four hours.

Anesthetics—The anesthetics, especially alcohol, are inclined to relieve asthma. Alcohol is frequently very useful, especially if combined in fair dosage with acetyl salicylate. This combination is a useful substitute for morphine in many cases.

Habit Forming Drugs—Habit forming drugs are absolutely contra-indicted except in emergencies which justify the chance of causing addiction. This applies especially to morphine. The hardest cases of asthma to cure are those who have become addicted to morphine.

SENSITIVENESS TO PHYSICAL AGENTS

There is a type of reaction which is very similar in history and symptomatology to the types previously described except that instead of its being caused directly by a



FIGURE XVII—Local Urticaria caused by scratching the skin of the patient with a glass slide. Note the fact that the oedema is confined to the area to which the irritating agent was directly applied. This area was surrounded by a much larger area of erythema. This patient was not sensitive to light and cold, nor to material substances.

material substance such as egg or pollen, it is caused specifically by sensitiveness to a physical agent such as light, heat, cold, scratches, or in case of sensitiveness to heat, by the effect of physical or mental effort. This type of sensitiveness may occur in patients who have typical allergic manifestations caused by pollen, egg, milk, or what not, or it can occur in patients in whom no sensitiveness of any sort can be found except to the physical agent itself.

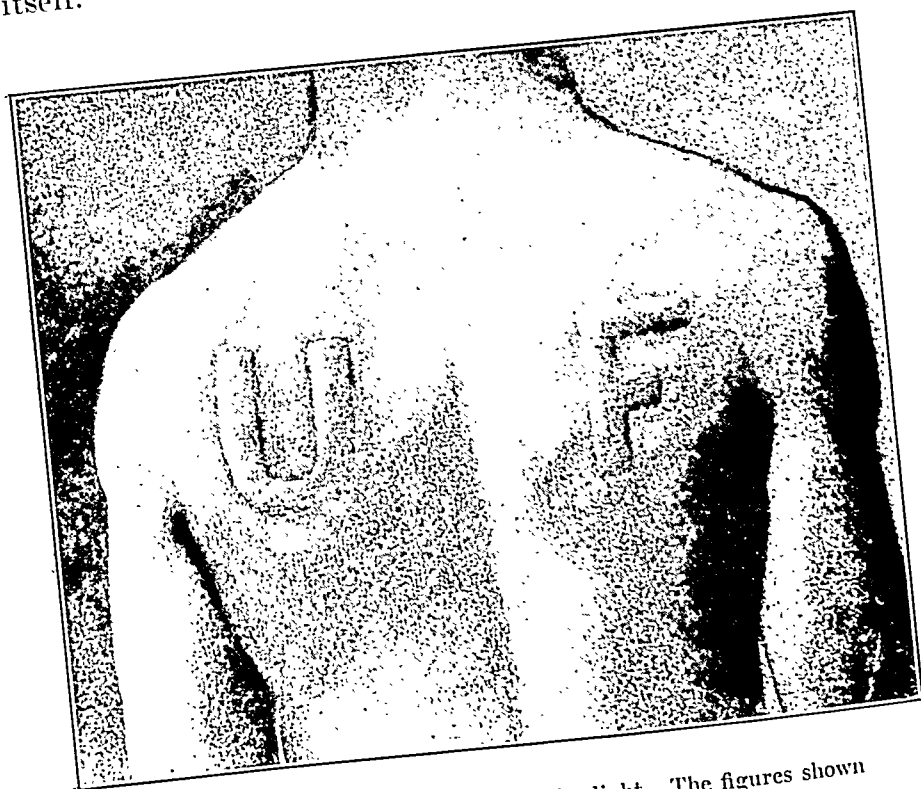


FIGURE XVIII—Urticaria caused by light. The figures shown here were caused by areas of oedema brought out by exposing skin areas to sunlight for two and one-half minutes through cardboard in which these figures were cut. Note that the oedema is confined to the areas directly exposed to light. A larger area of erythema surrounded these. The skin of the patient was not affected by scratches or by cold or material substances.



FIGURE XIX—Urticaria caused by applying ice water to the skin of the back. The oedema shown in this photograph was confined to the skin areas wet by the cold water. A larger area of erythema surrounded the oedema. The skin of this patient was not affected by scratches or by light or by material substances.



FIGURE XX—Chronic Perennial Dermatitis of many years' duration so severe as to incapacitate the patient for work, and caused by sensitiveness to heat. The skin of the patient would become relatively clear if he kept quiet and cool for several days. It would reappear several hours after exposure to heat or after a little physical or mental effort.

A number of years ago I described a group of such cases under the non-committal term Physical Allergy. Two types of reaction were noticed. One type occurred at the site of the point of contact with the physical agent. This was designated a Contact Reaction.

The other type occurred at the point of contact and in distant structures as well and frequently only in distant structures. This latter type of reaction was called a Reflex-like Reaction. This series of cases were interesting in that the manifestations were almost identical with those caused by egg sensitiveness or pollen sensitiveness.

Local or contact reactions caused by light, or scratches or cold are identical in their manifestations and behavior

and are examples of the old "factitious urticaria" except in that it can be caused by light or cold in some individuals just as it can be caused by scratches in others. The three illustrations show in one case a reaction caused by exposure of the skin to light, in another case by exposure of the skin to cold, and in another case by exposure of the skin to scratches. The reaction is characterized by redness, oedema, and itching. The oedema is confined to the point of the application of the physical agent. If in a patient of this type who is sensitive to cold, the conjunctivae and nasal membranes are chilled by the effect of cold air, typical coryza appears differing in no respect from that caused by pollen. Furthermore, if chilled air is breathed, cough and symptoms resembling asthma may appear. If a very large surface of skin is exposed in one of this type of cases, generalized symptoms resembling shock may appear. This, in two of my patients has caused complete collapse for which they were given adrenalin. If a patient is not highly sensitive and reacts slowly, the manifestation is not likely to come out as itching and hives. It may come out rather after a period of several hours in the form of eczema at the point of contact with the physical agent.

I suggested several possible theoretical mechanisms through which reactions of this sort might come about. The most romantic was based on an assumption that a patient of so-called atopic strain might become sensitive to some new body formed in the tissues under the influence of light or cold or scratches, as the case may be, and react upon application of the physical agent in the same way that a pollen sensitive case reacts upon application of pollen. Much can be said in favor of this point of view.

A second possible explanation was based upon an assumption that some individuals might become abnormal in such a way that their tissue proteins might break down under the influence of a physical agent with the liberation of a histamine like body and that the histamine like body might cause the peculiar reaction displayed by the patient.

It is a well known fact that histamine injected locally in the skin will give a hive reaction which is identical with that caused by the application of light or cold or scratches in sensitive cases. This point of view has more recently been suggested by Lewis who has by indirect evidence made the view seem more plausible.

I suggested three other possible explanations which need not be taken up in this connection.

This type of physical sensitiveness is interesting in that tolerance for the physical agent to which the patient reacts can be given by frequent exposure to the agent. For instance, light sensitive cases can be given tolerance for light by exposure to light. Scratch sensitive cases can be given tolerance for mechanical irritation of the skin by having them scratch themselves with a stiff brush at frequent intervals, and finally cold sensitive cases can be given tolerance to cold by cold baths. Tolerance can be raised to such a point that they can easily stand exposure to cold which might have caused a marked or even dangerous reaction before treatment was started. This method of increasing tolerance is useful in the treatment of dermatitis caused specifically by exposure to light or cold or scratches. It has to be carried out carefully and adequately in order to obtain a desirable result.

Whereas contact cases such as those above described are rather uncommon, reflex-like reactions are quite common. Coryza, asthma, urticaria, angioneurotic oedema, pruritis and many types of dermatitis caused by sensitiveness to heat or cold or to the combined effect of heat in one locality and cold in another, are frequently observed. Sensitiveness to heat is much more common than sensitiveness to cold.

Heat sensitiveness is characterized by reaction when the patient acquires a degree of heat which is beyond his tolerance. The source of the heat is a matter of indifference in many cases. The heat of a hot lamp or sunlight, a diathermic current, the drinking of a glass of hot water

or hot food, or heat generated by mental or physical effort may have the same effect. Some patients react most markedly to heat after exposure to cold, in which case they have symptoms in winter rather than in summer. Some acquire tolerance for heat during hot months and lose it during winter months. Cases of this type react most markedly on the first warm days of spring or summer. Many cases, however, do not become acclimated or declimated by weather changes, in which case they are inclined to react most markedly on warm humid days especially after mental or physical effort.

There is another type which reacts most markedly to heat if simultaneously exposed to cold. For example, some cases of asthma react most markedly to effort if *breathing cold air*. They cannot tolerate exercise while breathing winter air, but tolerate mental or physical effort during warm months. In one marked case of this sort who had asthma each night, symptomatic relief was obtained through such a simple procedure as sleeping in a warm room with little cover.

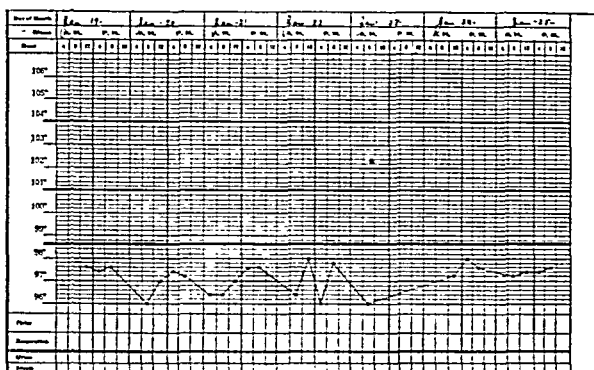
Symptoms of heat sensitiveness may be classified as:

First: General or constitutional reactions.

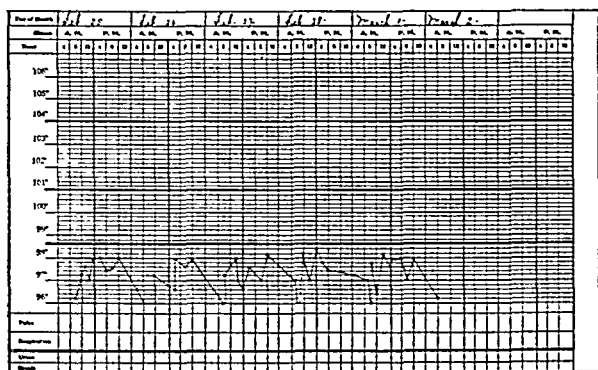
Second: Symptoms referable to a given organ.

Third: Symptoms referable to one of the three cooling surfaces, that is the skin, the nasal membranes, and the bronchial mucous membrane.

Symptoms vary in different individuals in intensity, in the quickness with which they appear, and in location. In some patients the symptoms are chiefly constitutional. Classical illustrations of this are heat prostration and the effort syndrome. In classical cases of Lewis' effort syndrome, typical symptoms can be elicited frequently by warming the patient up with a hot lamp, or by immersing the hands and fore-arms in a water bath at 42 degrees centigrade. The attacks can be prevented or stopped by the simultaneous application of cold. Symptoms caused



XXI



XXII

FIGURE XXI-XXII—Typical temperature charts of heat and cold sensitive cases. The charts are characterized by their being almost constantly subnormal, irregular, and unstable. The frequent ups and downs so commonly observed in charts of this type are due to exposure to heat or cold or to the effect of the heat produced by exercise. The frequent marked rises shown by the dotted line in Figure XXII were brought out by a little exercise followed by a cold-bath.

by effort syndrome can often be stopped by the rubbing of the hands and arms with ice. In the majority of cases which I have tested symptoms may be elicited by immersing the hands and fore-arms in water at 42 degrees centigrade even if tourniquets are applied above the elbows so tightly that blood can neither enter nor return from the arm. Evidently, the clinical manifestations in this type of case originates in an increase in the sensation of heat.

Symptoms referable to the cooling surfaces are practically identical to those caused by sensitiveness to pollen or egg, namely, coryza, bronchial asthma, pruritis, urticaria, or dermatitis, etc. They likewise can be reproduced by the suitable application of heat and can be relieved by the adequate application of cold. A typical example of this type of reaction is that of a patient who had a summer dermatitis of the face which was so severe as to keep her from appearing in public places during the summer months. I saw her in the winter and reproduced the dermatitis through immersing her hands and fore-arms in a water bath at 42 degrees centigrade for one minute, even with tourniquets tied so tightly above the elbows that blood could neither enter or return from the arm. The dermatitis could be as quickly relieved by the application of ice to the fore-arms and hands even before the removal of the tourniquets. Removal of the tourniquets made little difference in the skin manifestations on the face.

Cold sensitiveness may be exactly similar to the above except that the reactions are caused by cold instead of by heat. Symptoms in a cold sensitive case can be relieved by a hot lamp, by immersing the hands and fore-arms in a water bath of 42 degrees centigrade or by the heat produced by mental or physical effort. I had one case of asthma caused by cold sensitiveness which was once temporarily relieved by a physical encounter.

Whereas, heat sensitive cases instinctively seek a quiet life, cold sensitive cases seek a life of activity. It is

unfortunate for the patient if the career and environment which he has instinctively chosen is changed to the reverse. Many heat sensitive cases who instinctively led a sedentary life were drafted during the war, and caused to make an effort which was beyond their tolerance. They suffered from symptoms such as effort syndrome, heat prostration, coryza, asthma, dermatitis, or urticaria. Cold sensitive cases may be equally unfortunate if they are taken from a life of effort and caused to lead a sedentary life. This may be illustrated by one of my patients who was brought from a life of activity to one of inactivity through the prolonged illness of her husband. At the time I saw her, she was the more ill of the two, and was relieved when she resumed her previous life of effort.

The recognition of the above types of illnesses is very important both for the patient and for the physician. One is limited in his methods of treatment in heat sensitive cases, but can frequently give advice concerning habits and activity, which are useful. Cold sensitive cases often gain such tolerance for cold through the effect of cold baths, that they can frequently live in comfort. Heat sensitive cases acquire tolerance with difficulty or not at all. Severe cases are unfortunate. Mild cases can often readjust their lives and habits so that they can live in comfort.

Dry air is better for either class of case than humid air—in fact, for highly sensitive cases, prolonged exposure to humid air may actually menace life and health. The heat regulating mechanism can function more easily in dry than in moist air because of the cooling effect of evaporation by dry air and its lessened conductivity for heat.

Both heat and cold sensitive cases are unduly susceptible to infection in the bronchial and nasal mucous membranes after exposure to variation in temperature which would be a matter of indifference to a normal person. In the cases who live in changeable climates, we often find a history of frequent attacks of coryza or pneumonia.

It is impossible to discuss adequately such a complicated problem in the short time at my disposal. I hope, however, that I may interest the readers in the further study of the condition. It is definite, relatively common and causes much trouble.

Heat and cold sensitiveness of this class is due, I believe, to a disorder in the heat regulating mechanism. The disorder in the heat regulating apparatus is caused commonly, I believe, by an acute febrile disease. In this case nothing can be found on examination except an almost constantly subnormal temperature, hypotension, subacidity or achylia and sensitiveness to the effect of heat or cold. In many so-called secondary cases, it is caused, I believe, by some local or general disease which impairs the normal action of the heat regulating mechanism and hampers its effort to maintain temperature at levels which are ideal for body function.

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NOVEMBER 1ST.

Interpretation of kidney function in clinical practice.

Dr. Herman O. Mosenthal, Professor of Medicine, New York Post-Graduate Medical School and Hospital.

Kidney function in its physiological interpretation according to modern researches—these physiological principles applied to clinical tests—the value of tests of renal function interpreted in this manner in clinical medicine.

NOVEMBER 8TH.

Parasitology from the clinical standpoint.

Dr. Francis W. O'Connor, Associate Professor of Medicine, Columbia University.

Animal parasites known to cause disease in temperate climates. Parasites affecting emigrants from warm climates, symptoms occurring amongst such persons indicating careful examination for parasites. The influence of some parasites in preventing or retarding convalescence after other disease conditions.

NOVEMBER 15TH.

Present day treatment of syphilis with a consideration of the comparative value of remedies employed.

Dr. Jay F. Schamberg, Professor of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania.

Discussion of the value of arsphenamin, neoarsphenamin, sulpharsphenamin, bismuth, mercury and the iodides in the treatment of syphilis. Remarks upon the laboratory and clinical evidence bearing

upon the relative importance of each medicant. Outline of the treatment of syphilis in the primary and secondary stages, in latent syphilis, in visceral syphilis, in congenital syphilis, and in neurosyphilis. Discussion of malaria and other fever inducing agencies in the treatment of neurosyphilis. Brief reference to foreign protein injections and hygienic measures to increase the native resisting power.

NOVEMBER 22ND.

The relation of orthopedics to pediatrics.

Dr. Frank R. Ober, Instructor in Orthopedic Surgery, Harvard University.

A discussion of the value of co-operation between the pediatrician and the orthopedic surgeon. A consideration of the diagnostic points of border-line cases, such as poliomyelitis, acute articular rheumatism, rickets and allied conditions, and tuberculosis of joints. The relation of foot strain, posture, etc., to the undernourished child. Finally, some attention will be paid to therapeutic measures in several of the diseases which belong both to the pediatrician and to the orthopedic surgeon.

DECEMBER 6TH.

The psychic factor in cardiac disorders.

Dr. Lewis A. Conner, Professor of Medicine, Cornell University Medical College.

Doubt concerning the integrity of the heart excites a much more violent psychic reaction than is the case with disturbances of other organs. Frequency and importance of cardiac neuroses. The psychic factor in organic heart disease. Value of reassurance and encouragement in the treatment of cardiac disorders.

DECEMBER 13TH.

Acidosis and the water exchange.

Dr. John P. Peters, Professor of Medicine, Yale University. Consideration of the nature of acidosis and its relation to changes in the water and salt content of the body and the bearing of these factors on the treatment of disease conditions.

DECEMBER 20TH.

Inheritance as a factor in disease.

Dr. Raymond Pearl, Professor of Biology, Johns Hopkins University.

1930

JANUARY 10TH.

The cancer problem in its various phases.

Dr. Joseph Colt Bloodgood, Clinical Professor of Surgery, Johns Hopkins University.

Cancer as a world problem, as a public health problem, as a problem of the medical, dental and nursing professions, of the expectant mother and the mother of children, as an individual personal health problem, as a research problem.

JANUARY 17TH.

The failing heart of middle life.

Dr. David Riesman, Professor of Clinical Medicine, University of Pennsylvania.

There is a marked increase in deaths from diseases of the heart. This increase affects especially the middle and later periods of life. The causes and nature of this type of heart disease, its early recognition, and its treatment.

JANUARY 24TH.

The eye in relation to general medicine.

Dr. Edgar S. Thomson, Surgeon, Manhattan Eye, Ear and Throat Hospital.

Eye headaches (their character), muscle disturbances, significance of conjunctival and corneal diseases, causes of iritis and cyclitis, choroiditis, retinitis, vascular changes, (hemorrhage). Optic nerve, neuritis, choked disc, functional changes, hysteria.

FEBRUARY 7TH.

The diagnosis and treatment of meningococcus meningitis.

Dr. Stafford McLean, Assistant Clinical Professor, Diseases of Children, Columbia University. Attending Physician, Babies' Hospital.

The clinical manifestations of meningeal irritation, the indications for diagnostic lumbar puncture, the methods and routes in serum therapy, results.

FEBRUARY 14TH.

The premarital examination and conjugal adjustments.

Dr. Robert L. Dickinson, Senior Gynecologist and Obstetrician, Brooklyn Hospital.

New data from 1000 marriages with follow-up. Varying sexual factors in successful marriage. Preventive methods of minimizing frigidity, dyspareunia, abortion and sterility.

FEBRUARY 21ST.

Psychiatry's part in preventive medicine.

Dr. Arthur H. Ruggles, Chief Neuro-Psychiatrist, Butler Hospital, Providence.

Previous to fifteen years ago, psychiatry was largely concerned in the classification and custodial care of mental disease. Since that time much progress has been made in the understanding and treatment of such diseases as general paresis, in a better understanding of schizophrenia and of the manic-depressive psychoses. Psychiatric examinations in the schools have done much in the way of prevention, and in the child guidance clinics a valuable piece of work in prevention and research is being accomplished. Industry is studying the personality factors in its workers, and mental hygiene has become a part of the health departments of many of our colleges.

FEBRUARY 28TH.

Specific hypersensitiveness as a cause of symptoms in disease.

Dr. Arthur F. Coca, Serologist, New York Hospital, Professor of Immunology, Cornell University.

Pathology and symptomatology of anaphylaxis in lower animals; idea of specific mechanism and shock tissue in specific hypersensitiveness. The shock tissue and shock organs in atopic human hypersensitiveness; influence of heredity. Non-atopic forms of human hypersensitiveness. (Specific dermatitis; hypersensitiveness of infection.)

MARCH 7TH.

The treatment of nephritis.

Dr. Rolfe Floyd, Physician, Roosevelt Hospital.

Treatment of the inflammation of the renal tissue. Treatment of dropsy and allied conditions. Treatment of uraemia. Treatment of hypertension and its results.

MARCH 14TH.

The diagnosis and treatment of cerebral neoplasms.

Dr. Charles A. Elsberg, Professor of Neurological Surgery, Columbia University.

The symptoms that should make the general practitioner suspect a brain tumor. The diseases with which tumors of the brain may be

confused. The time when the diagnosis can be made and when the patient should be referred for surgical treatment. The surgical treatment of brain tumors, and the results that can be obtained.

MARCH 21ST.

Can our methods of obstetric practice be improved?

Dr. Benjamin P. Watson, Professor of Obstetrics and Gynecology, Columbia University.

A short survey of methods of obstetric practice in different countries. Contrast between hospital and domestic practice. Can the latter be made to conform more closely to the former? Would the trained midwife or obstetric nurse be a help or a hindrance?

MARCH 28TH.

The treatment of general infections of the bloodstream.

Dr. Alphonse R. Dochez, Professor of Medicine, Columbia University.

Consideration of the conditions under which bacterial invasion of the blood takes place. The practical difference between so-called bacteremia and septicemia. The use of chemical agents for sterilization of the blood. The use of biological agents for sterilization of the blood. The importance of local foci of infection in the continuance of septicemia.

APRIL 4TH.

Diseases of the arteries of the extremities and their treatment.

Dr. Leo Buerger, Attending Surgeon, Bronx Hospital.

Importance of the recognition and differentiation of the inflammatory thrombotic and degenerative types of occlusive diseases of the arteries from a pathological standpoint. Importance of the segregation of the entity thrombo-angiitis-obliterans from what the lecturer regards as angio thromboses. Discussion of treatment of arterial diseases per se. Methods of treatment directed towards the impaired circulation resulting from occlusive changes in the arteries and veins.

APRIL 11TH.

Drug addiction.

Dr. Alexander Lambert, Professor of Clinical Medicine, Cornell University.

Drug addiction. Psychologic causes of all narcotic addiction. Some misconceptions regarding drug addicts. Comparative discussion of various treatments. Management and prognosis of individual drug addicts.

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FELLOW AND HONORARY FELLOW ELECTED

OCTOBER 3, 1929

Livingston Farrand, M.D., LL.D., President of Cornell University, Ithaca, New York.

John Toole.....30 East 40th Street

DEATHS OF FELLOWS OF THE ACADEMY

SAMUEL FELDSTEIN, M.D., 50 Plaza Street, Brooklyn, New York; graduated in medicine from the Harvard Medical School, Boston, Massachusetts, in 1902; elected a Fellow of the Academy, December 3, 1908; died, September 14, 1929. Dr. Feldstein was a Fellow of the American Medical Association and a member of the County and State Medical Societies. He was a member of the Society of Associated Alumni of Mt. Sinai Hospital, a member of the Pathological Society and the Pediatric Society, Pediatrician to the Jewish Hospital of Brooklyn and Consulting Physician to Kingston Avenue Hospital, Brooklyn.

IRWIN HOWELL HANCE, M.D., Lakewood, New Jersey; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1883; elected a Fellow of the Academy, February 3, 1887; died September 28, 1929.

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The Wesley M. Carpenter Lecture

THE IMPORTANCE OF THE EMOTIONS IN THE ETIOLOGY AND PROGNOSIS OF DISEASE*

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That the variety of life is, for the most part, a sequence of "thrills" and "jolts," best interpreted as conscious affective emotional reactions, we all know only too well. The flushing and the paling of the cheeks in states of pleasure or anger; the tremor when embarrassed; the drying of the mouth by fear; the quickened and strengthened action of the heart when startled; vomiting, diarrhea, even fecal vomiting during an emotional shock;—these are but a few illustrations often cited. Various writers recently have reviewed the results of the stimulation and inhibition of the secretions and movements of the gastrointestinal tract (Alvarez, *Journal A. M. A.*, Vol. 92, p. 123, Apr. 13, 1929) dependent on affective psychic states. Others have discussed skin eruptions, asthma, the cardiac rate, leucocytosis, etc. That the emotions play also a more or less determining part in the etiology, course and prognosis of disease probably no thoughtful physician has ever doubted, and few successful quacks, charlatans and medical fanatics would ever be ungrateful enough to deny. Nevertheless, while this is granted practically by all, yet this field has not, unless perhaps recently, seemed properly to belong to "regular" medicine. Conscientious practitioners since the time of Hippocrates have, must, in fact, so important is it, done their best to enlist the aid

* Delivered before The New York Academy of Medicine, October 17, 1929, in connection with the second Annual Graduate Fortnight.

of the emotional life of their patients in their therapy, and their results, when successful, have usually been ascribed to "power of personality," "suggestion," "psychotherapy," etc., terms which until recently have always implied criticism that a "regular" physician should stoop to such practices. "Regular" medicine, in so far as is possible, rests its methods on the findings of the preclinical sciences, and these sciences cannot deal with related phenomena, no matter how self-evident that relationship may be, like the quickening of the pulse rate during a pleasurable emotional state, unless it can in some way tamper with the mechanism which relates the two, and so get at least a hint of how much of a "propter hoc" element there is in a "post hoc" sequence. This, however, is just what the premedical and preclinical men recently have begun to do, and their efforts have not been without success.

The physiologists have ever taken particular pains to prevent the emotions from interfering with their mechanistic and chemical experiments. Only recently have these disturbing factors been themselves the object of fruitful physiological research, of which two illustrations may be cited: The work of Pawlow, who demonstrated the "psychic" secretion of gastric juice, and that of Cannon, who demonstrated the increase of epinephrin in the blood, and other bodily changes of animals in states of pain, fear and rage.

The bacteriologist also recently has helped, for he no longer teaches that *bacillus typhosus*, for illustration, is the "cause" of typhoid fever. It certainly is the only known specific cause, nevertheless the chain of etiology of typhoid fever is made up of other links also, and among them some which he had named "immunity," "resistance," "susceptibility," etc., and these, he knows, the affective psychical states of the patients can easily modify.

The clinical psychologist and the modern psychiatrist also have done their part to help, and it has been a large one, for they have shown, among other things, the importance of those emotions which, disassociated from the

conscious workings of the mind, have lost their controlling and directing power in purposeful, logical, or effective conduct, and, escaping the awareness of the individual, have become a part of an automatic mechanism which, in following out its career of unconscious self expression, explains many of the features of the psychoneuroses.

Then came the Great War with its thousands of cases of acute goitre, diabetes mellitus, etc., and its tens of thousands of boys with that condition called "shell shock," whose pathological physical states were so definite that at first one felt obliged to assume as causes some actual physical traumata of the brain. Later, however, we realized that under certain conditions a strong emotion can inflict a physical trauma just as truly as can a knife. Then, later, came our better knowledge of the internal secretions, thyroxin and insulin especially, substitution therapies administered in quantitatively accurate doses for deficiency-states the mathematically determinable shifting values of which depend in no small degree on the emotions. Woodyatt, better known as medical chemist than psychiatrist, expressed this fact well in his statement that in some cases of diabetes mellitus it is more important to follow the emotions than the blood sugar curve. Finally, the surgeons recognize that the differential diagnosis between certain functional disturbances of the colon, due to emotional conflict, and a dangerous intestinal obstruction calling for emergency operation, is not easy.

In other words, the internists now must study clinical psychology, for many problems which involve the emotional life of his patients now begin to face him. He may resent this, much preferring still to play with the tools of chemistry and physics, but the advance in the medical sciences, and especially in biochemistry, bring him face to face with certain psychical problems in much the same way as the moving platform of the assembly plant of the modern automobile factory presents to the waiting mechanic the immediate task. The physician is now in a position, however, to deal with these problems much more

efficiently than ever before. To-day he is like the modern business man who, seated comfortably at his desk on the twenty-fifth floor of an office building, over two hundred feet above the ground, occupies exactly the same spot in space where earlier some aeronaut in peril might have flown. So, during the past twenty-five years especially, the medical sciences have pushed forward the advancing edge of medicine, into new fields which we did not choose, but in which we must, can, and should work.

One of the first convincing proofs of this changed point of view was the program of the Medical Section of the American Medical Association at Washington on the morning of May 19, 1927, which contained five papers, all dealing with the emotional (psychical) factors in diseases. During the previous two years five of the nine papers in the medical literature of the world, as listed in the index of the *Journal of the American Medical Association*, dealt with the relation between the emotions and skin eruption, especially urticaria, but also eczema, rosacea, psoriasis, and herpes; two, with their relations to high blood pressure; two, with basal metabolism; one, with leucocytosis; and one with asthma. Only two of these papers discussed the possibility of a relationship between the emotions and organic lesions, one citing gastric and duodenal ulcer (Mucci, *Arch. ital. di Chir.* Aug. 1926, reported such lesions following emotional stress, and suggests as cause a disturbed balance between vagus and sympathetic innervation due to the emotions, to toxins, or to both) and our own of December 1926 on acute goitre. Since then writers on these subjects have been more at pains not to claim but to try to explain these relations. Recently the psychologists have shown themselves eager to explain internal medicine to us, a well intended but unfortunate effort, for any attempt to demonstrate the importance of a previously unstudied element in a medical problem should presuppose that all of the resources of well established clinical medicine have already been exhausted before we ascribe any importance to a relatively unknown factor. Fortunately now, however,

records concerning emotional traumata are as much a part of the ward histories as are notes on the heart, lungs, etc. Of course we need the aid of the clinical psychologist, we are just beginning to see how badly we do need him, but it is we, and not he, who must find a place for his methods and evaluate their result, for clinical medicine is safe and sane in proportion as it subjects all of its data to the tests of anatomy, physiology and chemistry.

In approaching the subject of the emotions we should first recognize how difficult of definition the emotions are: how many different subjects are under discussion whenever two or more experts start to talk about them; with how great caution the psychologists discuss them. Some of the best referring to them chiefly in terms of degree of orientation rather than as qualities in our psychical life. Certainly we should not make the mistake of picturing the emotions as conscious psychical forces belonging to a high level which occasionally "reach down," invade, and interfere with the more elementary mechanical and chemical processes belonging to lower levels, but rather as integral and inseparable parts of many behavior mechanisms, perhaps of all, and at all levels, and which differ chiefly in the degree of awareness which they may attain. Too often we have in mind only those conscious mental processes involving choices or voluntary actions. Yet, even at these levels, the pattern of the mechanism involved in the affective psychic state and its physiological expressions seems at any one time to display an almost constant pattern. How fundamental these patterns, including their emotional element, must be is suggested by Cannon's work on the reversibility of these mechanisms, for he showed that in animals with all frontal lobes and much of their lateral cortex removed, and which therefore cannot be imagined as having any emotions, any occasional automatic muscle movement they make which happens to be similar to those which the normal animal would make when angry will produce a similar rise of blood pressure and increase of blood sugar as happens in the excited animal. We emphasize this point to illustrate the probable presence of, and

the importance of, an emotional element in even simple physiological processes and the foolishness of even trying to disregard it, and especially when we are dealing with invalids whose abnormal physiological states cannot but be to them a reason for unusual interest or actual apprehension.

It also should be emphasized, and in advance, that temporary modifications of well recognized functional patterns, such as the curve of the secretion of gastric juice, or the peristalsis of the intestines, are one thing, while local spasm at the pylorus or sigmoid is quite another; and that we should have physiological authority before we place any of the latter in the group of the "purely functional" phenomena. Again, a temporary modification of a functional pattern is one problem, while the production of definite objective structural alterations of a tissue is a quite different matter.

Our own interest in this subject was aroused years ago by our department of medical sociology. By this term I do not refer to our department of social service, which also is valuable, almost indispensable, to us. For us, medical sociology had its birth in Baltimore in 1901, with, as its object, the better education of the medical students, as well as better diagnosis and better therapy for the patients in the ward; while social service, born in Boston three years later, has as its object any helpful social aid possible to the patient. Our medical clinics already had assistants in clinical pathology, clinical bacteriology, clinical serology, clinical roentgenology, clinical chemistry, etc.; we needed also one in clinical sociology, who could apply for the benefit of our patients the methods and accumulated knowledge of that science. Like the others, this assistant belongs to the medical staff. Although always one of the social workers yet, while assigned to medical service, she is not, as are they, a free lance responsible to none, and interested in seeing how many patients she may be able to help in any way she may be able to help them. She, like the others mentioned, plays her part on the team of the

Professor of Medicine, and under his orders. What she does is not intended as direct service to the patient, is not charity, but is in the interest of more accurate diagnosis and more efficient treatment. This assistant, however, shows her sociological training best when, after the patient is discharged, she tries to correct or to compensate for those elements in his social environment which assisted in making him ill, lest later they may assist also to produce a repetition of his trouble. As a result of this work we have felt obliged to re-evaluate several elements in common clinical pictures. Her first duty is to obtain a new kind of clinical history of the case, one which is in addition to, and is very different from, those which the clinical residents and clerks take. Hers is not a record of what the patient said and what his family told her, suggestive though their statements may be, but an accurate picture of the past life of the patient in terms of his social group, together with a study of those social factors which possibly contributed to his present illness. Just what the patient, or his relatives, or his neighbors tell this worker is no more a part of her final history of his present illness than is his graphic description of his stomach aches a part of our final note on the condition of his gastrointestinal canal. We would urge this point, for our medical sociologist strives not to test the accuracy of the patient's story, for a detective would do this better, but to determine the real significance of the elements of his story. A study of the clinical history of recent cases reported to show the importance of the emotions in medicine will illustrate this. Here, for illustration, is a patient whose symptoms suggested an acute abdominal surgical condition; a surgeon was called who suggested operation, but before he could perform it the condition began to clear up quickly and completely; a few days later the patient related that on the particular day of the consultation she had had a very distressing emotional conflict. Does this prove anything? Such stories are to us very unconvincing illustrations of the medical effects of emotional conflict. One such patient had a distressing conflict and at the same

time agonizing pain in the upper right quadrant of the abdomen, then, sudden relief; diagnosis, emotional conflict; but the surgeon found a huge gall stone which evidently had become engaged in the neck of the gall bladder and had then dropped back. In considering these, the most difficult of all cases, too little attention is paid to the enormous rationalizing powers of the patient, and too much "propter hoc" importance is given to "post hoc" sequence. So little do we trust those stories of emotional conflict which are told for the first time after the medical or surgical crisis is past, and so skeptical are we of the purely "functional" quality of any irregularity, of normal function which has not been tested in the laboratory, that we decided in our studies to disregard all so-called conflicts which played their part solely on the stage of the patient's mental life and to interest ourselves in those conflicts dependent on social crises which can be studied. It is at this point that our medical sociologist helps, for the stories of such conflicts need all the indirect supporting evidence we can get before we can accept them. Of great assistance also is the clinical psychologist, but his value in the clinic is so well recognized that we need but mention it now.

The injurious effect of a long maintained depressing emotion has never, we feel, been appreciated. We endure well the effects of strong emotions, if only their duration is brief or their qualities varied. That the depressing, contractile, paralyzing emotions called "fear," "apprehension," "worry," etc., weigh heavily in the balance against a patient during the course of an infection has long been suspected, but since these phenomena cannot be weighed, measured, nor rendered objective, we cannot at this point consider them seriously. The effect of these emotions on the glucose tolerance of a previously well standardized case of diabetes mellitus can, on the other hand, be measured in terms of sugar in the urine, of milligrams of glucose in the blood stream, and of units of insulin necessary to restore the sugar-free condition.

Certain thyroid disturbances also produce changes

which are measurable. In a former paper (*Indiana State Medical Journal*, December 1926, Volume 19, 475) we suggested the importance of the emotions in the production of acute thyroid conditions. In this we reported among others the case of a girl 22 years old with one of the largest visibly pulsating symmetrical thyroids we have ever seen. Two medical histories, excellently taken in the conventional manner, at different times, and by two different medical groups, had suggested the importance of one infected tooth which had recently been pulled. Hers was an unusual case of Basedow's disease. Some of its physical signs were too marked: the size of her goitre; the psychical and physical hypertension; the marked exophthalmos and marked V. Graefe, Moebius', Joffroy's and Stellwag's signs. Her tremor was unusually pronounced and in addition her whole body kept up a restless writhing motion. On the other hand some signs were not present or were too little marked. Her pulse, while often rapid, was not continuously so. It usually was normal, but occasionally it rose to 120 per minute. The most of the blood pressure records were about 110/50. Only once did it rise to 130/40. Her basal metabolism was reported as high (six records, the lowest plus 40 per cent., the highest plus 117 per cent., the mean, plus 70 to 80 per cent.) but it is difficult, sometimes impossible, to estimate the "basal" metabolism of these cases. So "tense" are they that even when they show no objective reactions to, and state that they are not aware of, any emotions, even then the pharmacodynamic influence of their unpleasant memories, ideas and worries so lower the threshold of their emotional reactivity that they show an increased metabolism (Ziegler, Levine, *Amer. Journal of Medical Science*, Volume 169, January 1925). (One such patient, a man confident that he had an "inner" goitre, gave as readings on four successive attempts at three day intervals, plus 225 per cent., plus 150 per cent., plus 55 per cent., and minus 19 per cent.). That the above described girl's basal metabolism was not persistently high was suggested by the fact that she had lost

no weight, that her skin was dry, that she had constipation instead of diarrhea, and scanty menstruation. An interesting point was that she said, and three witnesses agreed (her grandmother with whom she lived, and two girls with whom she worked) that her thyroid had previously not been enlarged and that it had attained its present size suddenly, that is, during one week. Our medical sociologist had already taught us much about this group of cases, so we discredited this patient's story. The history which we got later, as the result of considerable investigation, showed that she had recently been the sole witness of her husband's murder of his two brothers. That shock, followed by the long continued strain of his trial, which resulted in his imprisonment for life, and later his bitter and repeated accusations that she had failed to obtain his acquittal on the plea of self-defense, was followed by the sudden appearance of this goitre. This history was the work, not of a psychologist, nor of a detective, nor of a father confessor, although all three functions were well served, but of one who could first visualize the girl's past life and her reactions to it.

The estimation of a psychical trauma and its resulting emotional conflicts of course does not and should not depend entirely on the patient's story of her inner mental life. Its social aspects allow us a more just evaluation. Of course sociology is not a science which explores a realm of knowledge outside the ken of everyday life, as do chemistry, biology and physics, it studies just "us folks." Its formulae are not cabalistic to all but the especially trained; they sound much like the bromidisms of daily life. You wonder what ability or advantage a medical sociologist has which the average medical student, graduate nurse, or social worker has not? Not much, but that little frequently is enough to spell success where previously the medical residents, always proud of their ability as medical cross examiners, had failed. This patient was very eager that the goitre be removed at once, which we refused to do. Operation on these cases usually is inevitable, but should be done only with great caution, and after long

and careful preliminary treatment. She therefore transferred herself to another hospital where the operation was done at once, but she did not leave the operating room alive.

A somewhat similar case was that of a young man 20 years old whose fiancée pretended to commit suicide by drinking a bottle of poison in his presence. He made a quick escape from that district and did not learn that she had deceived him until one week later, after his goitre was well developed, with thrill, tightness of the neck, nervousness and weakness. His basal metabolism was plus 24 per cent., his blood pressure 124/70. He had never associated his goitre with that experience. This man had no exophthalmos, no eye signs, no tachycardia. Another very unusual case, since successively three glands of internal secretion were involved, was that of a woman 32 years old who came to the clinic first with goitre and hyperthyroidism only (loss of weight, loss of strength, tachycardia, tremor and nervousness. Basal metabolism plus 65 per cent., blood pressure 140/80). Diagnosis, toxic goitre due to tonsillitis; later, tonsillectomy. She returned four years later still with these signs, but now the tremor was greater, there had been loss of weight, diarrhea, polyphagia, polydipsia and glycosuria. So great was her sense of suffocation and dysphagia that a bronchoscopic examination was made, but it revealed nothing. She still had slight exophthalmos and no eye signs. The basal metabolism, repeatedly taken, varied from plus 9 per cent. to plus 48 per cent., and her blood pressure from 110/60 to 180/100. The blood sugar on admission was 218 mgs. per 100 c.c. of blood but later normal (104 and thereabout). The glycosuria never exceeded 3 gms. per day and varied greatly, rather independently of diet and insulin therapy. Her two previous histories were all of the conventional variety, the first leading to a tonsillectomy. Now, however, a worker in medical sociology discovered two separate periods of emotional traumata; among them her husband's suicide in her presence as a protest against her manner of life, and later her son's

disgrace. The dyspnea and enlargement of her thyroid gland seemed to have followed the long period of screaming, terminated only by exhaustion, when she witnessed her husband's suicide. Four weeks later the symptoms of hyperthyroidism began.

A recent and even perhaps better illustration is that of a young woman 20 years of age who presented herself with a somewhat similar condition, although her coarse tremor had led to a diagnosis also of chorea. Our medical sociologist had made us sure of our grounds then, so we asked her if she had not had some psychological trauma, which she, and her mother with her, stoutly denied. So confident were we, however, that in our letter to her doctor we gave this as the diagnosis. When he confronted her with this the mother said that since we seemed to have had information which they thought nobody else knew, they might as well confess that prior to the development of this trouble the daughter had suffered an attempted rape, and only after a long struggle had escaped to her home in nervous shock. Since there had been no witnesses to this attack they had decided to avoid publicity by saying nothing about it. They were curious to know how we had obtained our information.

While all of these cases cited had acute goitre with marked nervous manifestations, all with marked tremor and continuous body writhings, all with a strangled feeling which in one case was severe enough to lead to examination with the bronchoscope, yet they are not cases of typical exophthalmic goitre—the picture is always incomplete. They do not always have loss of weight and strength, nor the diaphoresis, diarrhea, or profuse menstruation of typical cases. One or a few of these may be present, but others which we would suppose were due to similar causes, may be missing. Some had marked exophthalmos, some none, some only a positive Joffroy, or a marked V. Graefe or Stellwag. These are the patients whose facies best answers Moebius's description of the condition as one of "crystallized fear." The pulse in all

was high at times, but not continuously so, the rate depending more on current events. The "basal" metabolism was very deceptively high.

The fact that the development of these thyroid conditions seemed due, in part at least, to the emotions, does not in the least imply that psychotherapy is the proper treatment. There, we would take issue with some of the psychiatrists who state that disorders primarily purely psychogenic respond only to psychologic treatment. In fact we feel that few do. Psychotherapy is valuable, very, but no more so than in the other forms of Basedow's disease. Strong emotional excitation may lead a man to jump into the river with suicidal intent, but for him, when he strikes the water, to change his mind does not restore him to dry land. Either he must swim or someone must pull him out of the water. So in the treatment of these cases it is the surgeon with his knife who usually pulls them through. But surgery should be preceded by a long rest in bed, with iodine, various and potent sedatives, psychotherapy, hydrotherapy, physiotherapy, etc., until the pulse and basal metabolism are so stable that the patient seems ready for the operating table.

We have elsewhere spoken of the organs of internal secretion as liaison organs between the emotional and musculo-skeletal systems. These glands, however, are not individualistic in their activity, but rather form one interlocking system, and it is not always the same gland which weakens under similar emotional stresses. The question of tissue susceptibility may well be raised. In our goitre belt of the Middle West disturbances of the thyroid gland are common lesions. The thyroid would seem to be a tissue of lessened resistance; at least it is the organ often affected by emotional strain. Among the Hebrews the pancreas would seem to be the weak spot (we quote Dr. Solis Cohen of Philadelphia) since among them diabetes mellitus would seem to be a common result of functional overstress. Just how important this may prove to be in its etiology may be a question, but certainly during the

treatment of this disease it is the emotional states of the patient which so often upset our therapeutic and dietetic calculations.

That primary arterial hypertension, that is high blood pressure not associated with marked renal insufficiency, may follow, or at least, after it develops, may be markedly influenced by emotional stress, is generally accepted. These cases early, before there is a definite fixation of the vascular hypertense state, respond fairly well to psychotherapy, and also to change of environment, which is one form of psychotherapy.

In this connection we would merely mention our interest in the reported infrequency in the Orient of the three conditions we have considered: exophthalmic goitre, diabetes mellitus, and arterial hypertension. We have tried to get accurate data from several very well-trained medical missionaries in China, Korea and Siam. Naturally they replied cautiously concerning the last two conditions, on the ground that they see but a very small fraction of the huge total population surrounding them, and were unable to make thorough routine chemical and physical examinations which doubtless caused them to overlook these conditions which they admit they seldom see, nevertheless, they all emphasized the infrequency of exophthalmic goitre. There may be many reasons for this difference: racial and environmental, especially. Nevertheless, we would suggest as a partial explanation that these peoples are said almost uniformly to exhibit the mental pattern of a very stable society: half-starved, pessimistic, without hope, unable even to imagine any possible amelioration of their wretched physical, industrial, and social conditions. They "worry," but it is more a static condition; certainly it is not the very affective emotion which leads to active emotional conflict and to social struggle. Ours, on the contrary, is a civilization of hopefulness; the financial, political and social sky are the limits of our ambitions, and we struggle on restlessly to improve as many as possible of our great opportunities, and no mat-

ter how well we do, we fret because we don't do better. Continuous worry of this dynamic affective type is our mental pattern, and chronic fatigue is our condition. Some of you as students may have lived in certain European countries before the War, when, so far as the great mass of the population was concerned, society was so stable that each man was passive in his little sphere, realizing that there was little chance for him to improve his social status or that of his children. You will remember that each man, a small cog in a great machine, did the work allotted him, and that it seldom was hard. He knew just what he had to do, and he did it. When evening came he was not tired out. Not fatigued, his senses were agreeably affected by mild stimuli: soft, beautiful music, fine art, real poetry, and light beer and wines. The possible application of Weber's law to American modern life might yield illuminating results, for certainly it is true that the greater the fatigue the more violent must be a stimulus sufficient to give pleasure. None of us, no matter how busy we are, really overwork mentally or physically, but we do keep our emotions under high tension, which cannot but fatigue the organs through which the emotions express themselves physically, and as a result we require the violent stimulation of jazz, the impressionists' art, rhymeless poetry, raw whiskey, and also as a result we have primary arterial hypertension, idiopathic diabetes mellitus, true Basedow's disease, and one form of arthritis.

That the emotional states are one factor in the production of lesions of the musculo-skeletal system is often overlooked. One of the most common symptoms, especially among women, is backache, and to explain this the roentgenologist sometimes does find definite hypertrophic changes in the spine, which are so common that he is inclined to consider them almost within the limits of normal. It is this backache and its attendant discomforts which is the gold mine of most of the irregular medical cults, for nearly all direct their prime therapy to the spinal column. A defensible explanation of this backache is, we believe, the definite though slight increase of muscular hyperten-

sion due to suppressed emotion, similar to that which makes an interesting ball game so fatiguing, and a disagreeable conversation so exhausting. Women, especially, suffer, for a lady must be gracious, no matter how intensely her emotions may rage within her. Since pent-up emotions are forces which must impress themselves, they "take it out" on the spinal column, producing there a continuous muscular hypertension which cannot but be very fatiguing, and which various physical and mental therapies can relieve. We can easily understand how these joints, points of least resistance because of this unnatural tension, are easily infected, which explains that slight spondylitis so often present.

There is one type of arthritis, sometimes called sub-acute atrophic arthritis, which develops during the fifth decade especially in unmarried or childless women at the time of menopause, whether natural or induced, and especially in women who have lived under conditions of long continued and great emotional strain. It is our contention that this condition is primarily not an arthritis but a trophism affecting all the tissues of the extremities, cartilages, bones, muscles, adipose tissue, skin, and that it is called "arthritis" because the lesion of the joints are most evident to the patient, since their motion causes the one painful symptom. Often the onset of these cases is definitely associated with the menopause. For illustration, the first attack of pain in the extremities usually called "neuritis" since not definitely connected with the joints, may be an accurately timed substitute for the first menstrual period which fails, after which, during the next few months, at regular monthly intervals periodic exacerbations of this "neuritis" may represent later periods without flow. In most of these cases the disease begins, not in the joints, but as a condition of general malaise, of easy fatigability, often with paræsthesias of the extremities, and usually with early loss of weight, due, not to loss of adipose tissue (which may even increase), but rather to a loss of muscle bulk, as shown by the early muscular atrophy. One of the first objective signs of this condition

is a thinning of the articular cartilages, then a slow disintegration of the joints, which finally produces their extreme flexions, subluxation, and contractures, and which is accompanied from the first by trophic changes in the skin and its appendages, especially the nails. During the entire course of this disease it would seem to be the increased muscular hypertension which determines much the severity of the pain and the degree of the immobility of the joints. Relieve this, and the patients consider themselves as almost cured. I remember one woman with practically all her joints immobile who consented to have these joints mobilized by force under an anesthetic. No sooner was she under the ether than she flattened out on the table like a piece of soft metal on a hot stove, since all her joints then became quite limber. Trivial operations performed on such patients, for illustration, the removal of an epitrochlear gland for the purpose of taking cultures, produced a similar result and one so delightful that the patient begged that the gland on the other arm be removed also. This same relief may follow also certain intense optimistic emotional experiences. Indeed we do not at all doubt the genuineness of the relief to which the piles of crutches at various religious shrines bear witness, neither do we doubt the success of various unusual physical manipulations, strong electrical treatments, or dominating psychical appeals. In all cases, unfortunately, the relief is temporary, but the fact that there is any at all is a challenge to the medical profession, for surely we should try to understand and to use a therapy which under almost accidental and uncontrolled conditions sometimes proves so potent. By no means do all of the cases of atrophic arthritis which develop at the time of the menopause belong in this group. Many give a definite history of previous attacks of acute arthritis with all the signs of infection, dating back even to youth, but even these cases during the fifth decade undergo a change in type which makes them resemble more or less the group we are describing, which would suggest the introduction at that time of a new element in the etiology.

In the production of the above described cases of osteoarthritis the emotions would seem early to play some part. We had as patient a woman who four years before her admission was dragged about half a city block by a street-car in whose automatically closing door her coat was caught, and who, although no bones were injured and the skin was not even lacerated, nevertheless for eighteen months did not walk except when supported by a chair, crutch, etc., and for the past two and a half years has not at all. During these four years she had developed an extreme grade of atrophic arthritis. This woman previously had had an operation with the removal of the uterus and evidently of both ovaries also. Curiously enough, while she was in the hospital a similar accident happened to one of the mechanics of the hospital, a man seventy years old. He, however, was dragged four blocks and badly bruised, nevertheless he insisted on returning to work the following day and did so, suffering no further injury. It is important that our woman patient was notoriously emotional, a trouble maker well known to many doctors, and it is important also that it evidently had met with her approval that her room at the hospital from the day of the accident was the battle ground of doctors and lawyers striving in vain to effect some settlement in her case. Another woman, healthy until blown across the room by the explosion of a gas stove and superficially burned, developed this same form of arthritis. She had menstruated regularly until that explosion, but never after, the hot flashes beginning at once. There began too the nervous and vasomotor evidences of the menopause but also increasing weakness, paraesthesias, trophisms, and the lesions of progressive atrophic arthritis, later of extreme grade. A superficially similar condition developed in a young man who was almost buried in a caving-in gravel pit. Through the strenuous efforts of his two teammates, who shoveled incessantly for forty minutes, he was finally saved, but never again was well, and soon developed a severe case of atrophic arthritis. Three years after the accident, however, the eruption of keratosis blenorragica

appeared. We could, however, get no history of a gonorrhea nor find any evidence of a prostatitis.

Two possible errors were illustrated by the study of these cases. One, the confident belief that all of these cases are infections and that the removal of a focus of infection is enough to cure a progressing chronic disease. Few of these patients had escaped tonsillectomy and the extraction of all of their teeth, yet without benefit. Certainly our patients had not.

But even if the tonsils or teeth earlier or later had been important, the infection after the removal of these may be continued by neighborhood lymph nodes.

In our opinion this form of arthritis is not primarily an infectious arthritis. If we grant that infection may be an early factor it certainly is separated from the joint lesions by one or more mechanisms, among them, the internal secretions and the autonomic nervous system. Later, of course, infection adds itself to the picture, for these atrophying joints must be tempting points of least resistance to almost any germs which can find access to the bloodstream. However, early blood cultures, joint cultures, and cultures from excised regional lymph glands have failed to give us any convincing results.

Another common error is too great confidence in those self-regulatory mechanisms within the body which tend to operate correctively when a normal function pattern is disturbed, for a bad organ habit may be as persistent as formerly was the normal. Insomnia, nervous dyspepsia, all the ties, a continuing over-production of thyroxin, a continuing overmobilization of glycogen as glucose, a continuing spasm of the peripheral arteries, muscular hypertonicity, etc., would seem to continue long after the original reason for their presence has disappeared. We emphasize this rather theoretical point in order to emphasize a very practical mistake, common in internal medicine, that if one corrects the primary cause of a trouble, a psychological trauma for illustration, the trouble will of

necessity clear up. This is not necessarily true: organs owe their ability to function day after day for years according to a definite pattern in spite of disturbing factors to a controlling mechanism—nervous and chemical; but this pattern once definitely modified may continue to perpetuate a dysfunction almost as tenaciously as previously it had maintained the normal function. To break up the vicious habit requires much more than the correction of the primary etiology. So it is that a violent emotion may start some thyroid changes which all the psychotherapy in the world can't stop.

Of course one would not for a moment claim that the emotional factor in a physiological set-up is the most important, or a very important, or even a common, factor in the etiology of the conditions we have discussed. We would merely claim that it is important enough to deserve attention. And we would urge that in studying these cases we use the greatest caution in selecting the evidence concerning them. Certainly the patient himself is the least likely source of accurate and helpful information, and the more willing he is to help, the less help will he be. This new field of medical research, where hitherto quacks and fanatics had blindly, though profitably, ranged, promises to be most important, but certainly would seem to be far more difficult than those through which we have worked. For that reason great caution is necessary. May we resist the temptation of too rapid progress on tempting but insufficient evidence, and be willing to advance at that speed only which the further researches of the accurate preclinical and clinical arts and sciences, but including now psychology and sociology, may justify.

SOME NEEDS IN MEDICAL BIBLIOGRAPHY *

ARCHIBALD MALLOCH, M.D., M.R.C.P. (Lond.)

Librarian of The New York Academy of Medicine

LADIES AND GENTLEMEN: It is a great pleasure to see Cleveland and to meet in this beautiful library, and I hope that Dr. Lenhart, the Vice-President of the Association, will consent to preside at one or more of the sessions. During the past year Cleveland has suffered tragic losses and I am sure I voice the feelings of all the members of this Association when I seek to express our sympathy with the medical and nursing profession and with the public at large of this city.

Our Honorary President, Dr. Francis J. Shepherd of Montreal, died suddenly on the 18th of January of this year. He was born in 1851 at Como, close to Montreal, and throughout his life served well his University, McGill; his hospital, the Montreal General; his profession; and his town and country. His name will not be soon forgotten by those inside and outside of the profession, for he was one of the greatest of Canadian medical men. Generations of medical students remember him as an ideal teacher of anatomy, who, as he lectured, drew skilfully on the blackboard. His knowledge of comparative anatomy and the fact that he was a surgeon, were of great service to him in making his subject of great help and interest to his listeners. It is given to few to be Professor of Anatomy, a foremost surgeon of the Continent, and an acknowledged authority on skin diseases at one and the same time. Add to this that he was very well informed because he was a wide and wise reader, a connoisseur and collector of paintings and other works of art, and was President of the Montreal Art Gallery for fourteen or fifteen years. He was fearless in expressing his opinions and, although brusque at times, he had a heart of gold. He was chosen to give the first Osler Memorial Oration,¹ and

* Presidential Address at the Thirty-Second Annual Meeting of the Medical Library Association at the Library of the Cleveland Medical Library Association, 3-5 September, 1929.

¹ *Canadian Medical Association Journal*, 1929, xxi, 131-137.

wrote it, but he died before he could deliver it. I wish you all had known him and had fallen under his influence as I did.

Medicine, since the time of Conrad Gesner, Albrecht von Haller and Carl Peter Callisen down to those of Ludwig Choulant, John S. Billings, Robert Fletcher and Fielding H. Garrison, has pointed the way and, perhaps, even led along the paths of bibliography. Also we must not forget the bibliographical martyr, Dr. Robert Watt, and his general *Bibliotheca Britannica* (4 volumes, 1824) which is not restricted to medicine. When we are looking up what has been written on a medical subject, we often congratulate ourselves—and quite rightly too—that the field of knowledge has been so well tilled in comparison with some others. Our task, however, is not finished, and much remains to be done.

A USEFUL LIST OF REFERENCE BOOKS

Colonel Garrison has recently² compiled an exhaustive list of biographies, arranged by country, in which can be found the lives of medical men. Many of the biographies mentioned are indispensable even for a small medical library and they should be widely known. Such bibliographical lists have suggested to me what a splendid thing it would be for some one person, or some committee of this Association, to write a small book, let us call it *Useful Reference Books for a Medical Library* or, if you wish, name it *The Medical Librarian's Treasure*. Nearly all of you must know how useful Miss I. E. Mudge's *New Guide to Reference Books*³ is for general library work or for use in a medical library. We should use many of the entries in her book, such as those given in the lists of publications of societies, encyclopaedias, dictionaries, and books on the social sciences, sciences, useful arts, fine arts, literature, biography, geography, history, government documents, and bibliography. We all have our favourite

² "Available Sources and Future Prospects of Medical Biography," *Bulletin, N. Y. Academy of Medicine*, 1929, 2. s. iv, 586-607.

³ Chicago, American Library Association, 5th edition, 1929.

works of reference and we are inclined to think that others must know them. Let us make lists of our pet books, say a hundred or so, for the compilers. Details of the names, addresses, and lives of those who are still living are amongst the most difficult to find, but Mr. James Ballard of the Boston Medical Library has made a useful list of medical directories and I am sure he would let us cull some of them. The appendices in Colonel Garrison's *History of Medicine* would also be of great help. We know the Association was to publish a handbook of procedure, but the book I suggest would not provoke much discussion about library methods. Librarians would simply procure it and "proceed." To avoid great expense we might merely print our *Medical Librarian's Treasure* as a pamphlet and sell it at a low price to cover cost of material. As far as the very useful sections of the book giving lists of bibliographies are concerned, this work would be "a handy book about books which relate to books."⁴

INDEXES TO AUTHORS

You must have noticed that French books usually have very poor indexes and in referring to them for information one has either to depend upon a list of chapters and its summaries of their contents or go through the book page by page. There must be a reason for what to the Anglo-Saxon seems a grave deficiency; perhaps the French have such logical minds and have their information so well pigeon-holed that if a book is logically and properly written a certain fact would necessarily appear in a definite section of it and the intelligent reader should know where that section is. Now this difficulty may be overcome in the case of a scientific text-book by virtue of a little patience—but given an unindexed French bibliography what is one to do? There is a very fine bibliographical work in three volumes, namely, *Catalogues de la Bibliothèque Impériale*, Paris, 1857-1889, giving lists

⁴ Part of the title of Joseph Sabin's *Bibliography of Bibliographies*, New York, 1877, 8°.

of important books on all branches of medicine. It is true that one can learn to find one's way about in these tomes by referring to the tables of contents which are not all gathered together but are at the end of each. I had heard from Dr. Arnold C. Klebs that there was at the Bibliothèque Nationale a card index of the authors of this wonderful key to the older medical literature so I wrote seeking photostat copies of these cards for The New York Academy of Medicine, but the Librarian replied that it would be impossible on account of the great expense. So it remains for someone bookishly, or bibliographically, inclined to compile an authors' list which would make this bibliography of much greater service than it is at present. Should any of you know of a bibliographer, be he amateur or professional, who wishes something to do, tell him you can start him along the path which leads to fame.

It has often seemed a curious thing to me that our bibliographies set periodicals on a higher plane than mere books. Much attention is paid to the former, for are not the analytical entries made for each number—giving the author and subject of each paper—a proof of devotion? I do not suggest that all the chapters of a book written by one author should be indexed but for the larger handbooks, the systems, and encyclopaedias⁵ author and sub-

⁵ Such as:

Dictionnaire encyclopédique des sciences médicales... Directeur, A. Dechambre, Paris, 1864-89. 100 volumes.

Handbuch der pathogenen Mikroorganismen..., Hrsg. v. W. Kollé & A. Wassermann, Jena, G. Fischer, 1902-1904, 5 v. 2 Aufl. 1911-13, 8 v. 3 Aufl. 1927- -v.

Handbuch der biologischen Arbeitsmethoden Hrsg. von Emil Abderhalden. Berlin, Wien: Urban Schwarzenberg. 1920-

Handbuch der speziellen pathologischen Anatomie und Histologie... Hrsg. von F. Henke und O. Lubarsch. Berlin, J. Springer, 1926- (11 v.)

Surgery, its principles and practice by various authors. Edited by William Williams Keen. Philadelphia and London, W. B. Saunders Co., 1906-1921. 8 v.

Modern medicine, its theory and practice in original contributions by American and foreign authors. Edited by Sir William Osler, assisted by T. McCrae. Philadelphia, Lea Bros. & Co., 1907-10. 7v. 2 ed. Philadelphia & New York, Lea and Febiger. 1913-15. 5v. 3 ed. re-ed. by T. McCrae & E. H. Funk. 1925-1928. 6 v. 8°.

ject entries should be made in medical bibliographies or in our catalogues. Some of these articles are as important as monographs and surely merit as careful treatment at the hands of bibliographers or cataloguers. In this connection the *Index Catalogue of the Surgeon General's Library* is not consistent for only some of the articles in Kolle and Wasserman's *Handbuch* were indexed under subject and none by author. *Nelson's Loose-Leaf Living Medicine* was only partly indexed under subject headings and Osler's *Modern Medicine* was indexed in an irregular fashion. Let us suppose that a doctor is interested in the writings of Laennec. He will not find in the *Index Catalogue of the Surgeon General's Library* an author or subject entry for Laennec's article on "Anatomie Pathologique" which appeared in the second volume of the *Dictionnaire des Sciences Médicales par une Société de Médecins et Chirurgiens*, 60 vols., Paris, 1812-1822. Of course this article is referred to in lives of Laennec but some of the best papers by important Frenchmen were written for such encyclopaedias and they are extremely difficult to learn about. Laennec's earlier article on the same subject which appeared in a magazine⁶ is indexed under "Anatomy (Pathological)". Seeking an example of the love for periodicals, I took down the first volume of the *Journal de Médecine Chirurgie, Pharmacie*, etc., Paris, 1754, and chose at random an anonymous "Lettre sur l'épilepsie" on pages 403-416. Then, turning to the first series of the *Index Catalogue of the Surgeon General's Library* under the heading "epilepsy," I found the article had not been forgotten.

SUBJECT INDEXES

We all have a great interest in records—as well in other aspects of life as in games—and in trying to answer the questions "Who was the first to do or describe such and such a thing?" we often read accounts of the progressive stages in the growth of knowledge of diseases as a whole, of certain symptoms, or of methods of diagnosis

⁶ *J. de Méd. Chir. Pharm.* etc., Paris, 1805, ix, 360-378.

and treatment. Now these facts are discovered only by close study of the old medical writers. For instance we are told that the first written description of senile gangrene is that of Antonio Benivieni,⁷ in 1507 and the first of a typical case of appendicitis is that of Lorenz Heister in 1753.⁸ There is no telling what jewels are still to be dug out of these old books, for by no means all of them have been read through in late years and certainly we have no subject index to their contents. Fortunately a new and well-equipped mining company will soon be hard at work. I mean the Department of the History of Medicine at Johns Hopkins University with Professor William H. Welch at its head and I hope they will consider such deposits as this one and others that I indicate. The work will have to be done by trained medical men who have a good knowledge of late, and even canine, Latin.

Perhaps you would be surprised to hear what a bulk of books there are listed in the *Index Catalogue of the Surgeon General's Library* under "Medicine (Clinical, Cases of)"—four hundred and eleven in the first series and one hundred and ten in the second. As Colonel Garrison pointed out to me, this class of books is well described by Dr. Withington in his *Medical History from the Earliest Times*⁹ where he has translated some very interesting extracts. Some of these works are from the pens of distinguished authors, such as: Amatus (Lusitanus), Bartholinus, Benivieni, Boerhaave, Bonetus, Cullen, Dodonaeus, Fabricius (Hildanus) and so on down through the alphabet—Malpighi, Montanus, Pinel, Plater, Silvaticus, Tulp, and Vulpian. "Consilia" and "consultationes" are probably the commonest titles of these books but their names are almost legion, such as: "curiosities," "raccolta di osservazioni," "ephemerides medicopracticae," "observationes," "clinical studies," "cases from practice," "clinical

⁷ *De Abditis Nonnullis ac Mirandis Morborum et Sanationum Causis*, Florence, 1507, 16°. Case 71.

⁸ *Medicinsche Chirurgische und Anatomische Wahrnehmungen*, Rostock, 1753, 4°. p. 194 (observation, 111).

⁹ London, 1894.

histories," "aertzliche Berichte," "centum historiae," "conférences cliniques," "souvenirs médicaux," "sylloge observationum," "collectanae medico-chirurgica," "notes of hospital practice," and "controversiae medicae."

Now a summary of the contents of many of these works was made and published by Albrecht von Haller in the ten volumes of his bibliographies of anatomy, botany, surgery, and medicine¹⁰ which were issued between 1771 and 1788. Haller is a bibliographer after our own heart for he tells a little about the authors, gives titles and dates of different editions of their works and of the commentaries, the whole being arranged in chronological order with an author index. Alas! in some ways Haller was no more than human and the volumes have no subject index. Here is a noble piece of work waiting to be done, and, if done, we should have a key to the older medicine.

THE QUARTERLY CUMULATIVE INDEX MEDICUS AND INDEX CATALOGUE OF THE SURGEON GENERAL'S LIBRARY

Last year at the meeting in New York we discussed the *Quarterly Cumulative Index Medicus*—let us refer to it as the *Q.C.I.M.*—and a special committee was appointed to draft a letter to the American Medical Association telling how we think this immensely valuable publication could be improved. The editorial board of the *Index* is now considering our suggestions. The subject is coming up for discussion this year again and it is pleasant to think that Dr. Morris Fishbein of the American Medical Association will be here. I do not believe that Association is fully conscious of the great benefits they are conferring upon the medical world by publishing the *Q.C.I.M.* Our point is that it should be more complete so that not

¹⁰ *Bibliotheca Anatomica*, 2 vol. Leyden, 1774-1777. Author Index at end of vol. II.

Bibl. Botanica, 2 vol. London, 1771-1772. Author Index at end of vol. II.

Bibl. Chirurgica, 2 vol. Basel and Berne, 1774-1775. Author Index at end of vol. II.

Bibl. Medicinae Practicae, 4 vol. Berne and Basel, 1776-1788. Author Index at end of vol. IV.

only all the general practitioners of today will reap the benefit of it, but that the research workers and the present teachers of the practitioners of the future may rely on it absolutely. The subscription list would be bound to increase to cover greater cost. We do not ask that absolutely everything should be indexed but that the best papers in a larger number of medical periodicals should be noted. If these periodicals are not to be found in the smaller libraries, the larger ones will gladly lend them. I recommend that you read what Dr. Thayer, retiring President of the American Medical Association, has to say about the question in the *Journal of the American Medical Association*, 1929, vol. 93, pp. 201-202. The *Q.C.I.M.* is of great value in furthering medical education, but the results cannot be seen or gauged at present. It seems to me that the American Medical Association could afford to lose even more than they do now financially—returns in another kind would more than make up for that loss.

Dr. Thayer¹¹ has alluded to the rumour that when the third series of the *Index Catalogue of the Surgeon General's Library* is finished no other will be published. Do you realize that already the scope of the catalogue in this series has been much narrowed? "Beginning with volume vi [Ge-Izzet Bey, which came out in 1926] the material catalogued under subject titles covers only the period prior to January 1, 1926."¹² Suppose that the third series were finished in 1932 then under the heading "zymotherapy," which is the last entry in the second series, you would find no article of later date than 1925. From what I can gather, merely a year-book listing the new textbooks, theses, and all monographic material will be published every year after the third series is completed.

I do not believe that the Government of any other country ever supported such a piece of wonderful bibliographical work, but unless Congress can be urged to continue the *Index Catalogue of the Surgeon General's Library*, at least in the form of the earlier volumes of the third series, there

¹¹ *Loc. cit.*

¹² Vol. vi, p. iii.

is a dark and gloomy outlook for the medical research worker and writer of the future, not to speak of the staffs of medical libraries. The year 1950 is not a great way off; let us consider how we should look up what had been written on a subject if the *Index Catalogue of the Surgeon General's Library*, as we know it, had ceased to exist. First of all we should go through the three series of the *Catalogue* and then to cover a score or so of years we should have to look through two volumes of the *Q.C.I.M.* a year, and all the year-books of the Surgeon General's Library. Let us do all we can that only the highest ideals in bibliography shall prevail and that the work of Billings and Fletcher, so well carried on now by Garrison, shall be continued year by year, step by step. Perhaps we might take one of Sir William Gull's favourite quotations as our motto:

If I was a tailor
I'd make it my pride
The best of all tailors to be;
If I was a tinker
No tinker beside
Should mend an old kettle like me.

NOTICE

The Academy wishes to announce changes in the 1929-1930 Afternoon Lecture Series as follows:

1. December 20, 1929

Dr. Charles A. Elsberg, on the subject "The diagnosis and treatment of cerebral neoplasms."

(This date has been changed from March 14, 1930.)

2. March 14, 1930

Dr. Alphonse R. Dochez, on the subject "The treatment of general infections of the bloodstream."

(This date has been changed from March 28, 1930.)

3. March 28, 1930

Dr. Raymond Pearl, on the subject "Inheritance as a factor in disease."

(This date has been changed from December 20, 1929.)

RECENT ACCESSIONS TO THE LIBRARY

- Bechhold, H. *Die Kolloide in Biologie und Medizin*.
5. Aufl. Dresden, Steinkopf, 1929, 586 p.
- Bolton, E. R. *Oils, fats & fatty foods, their practical examination...*
London, Churchill, 1928, 416 p.
- Brack, E. *Über Ärzte und Medizin in Hamburg vor Hundert Jahren*.
Hamburg, C. Behre, 1929, 63 p.
- Carpi, U. *La collassoterapia nella tubercolosi polmonare...*
Milano, Cooperativa Farmaceutica, 1929, 268 p.
- Castex, M. R. *La hypertension arterial*.
Buenos Aires, Andreetta, 1929, 590 p.
- Cathcart, E. P. *The human factor in industry*.
London, Milford, 1928, 105 p.
- Champy, C. *Le corps humain*.
Paris, Rieder, [1928], 83 p.
- Chiarugi, G. *Trattato di embriologia*.
Milano, Società Editrice Libreria, 1929, v. 1.
- Christopher, F. *Minor surgery*.
Phil., Saunders, 1929, 694 p.
- Dartigues, L. *Le renouvellement de l'organisme; endocrinothérapie chirurgicale*.
Paris, Doin, 1928, 421 p.
- Doiteau, V. & Leroy, E. *La folie de Vincent van Gogh*.
Paris, Editions Aesculape, 1928, 142 p.
- Duchesne, G. *Éléments de déontologie appliquée*.
Paris, Baillière, 1929, 132 p.
- Eliason, E. L., Ferguson, L. K., & Lewis, E. K. *Surgical nursing*.
Phil., Lippincott, [1929], 566 p.
- Escardo y Anaya, V. *Alimentos del lactante*.
Montevideo, Lacañe Hnos, 1929, 98 p.
- Études sur la chimie physiologique de la peau, par... Dejust, Verne, Combes...*
Paris, Legrand, 1928, 379 p.
- Festskrift til Bernhard Bang*.
Kobenhavn, Kandrup & Wunsch, 1928, 389 p.
- de Fleury, M. *Les fous, les pauvres fous et la sagesse qu'ils enseignent*.
[Paris], Hachette, [1928], 271 p.
- de Forest, P. A. *Comment lutter contre les épidémies*.
Nouv. éd. Dammarie-les-Lys, Les Signes des Temps, 1929, 128 p.
- Gosney, E. S. & Popenoe, P. *Sterilization for human betterment*.
N. Y., Macmillan, 1929, 202 p.
- Guermontprez, F. *Recherches sur les vicissitudes de la liberté en médecine*.
Paris, Legrand, 1928, 312 p.
- Gunn, J. A. *An introduction to pharmacology and therapeutics*.
London, Milford, 1929, 220 p.

- Herrmann, E. Die Eklampsie und ihre Prophylaxe.
Berlin, Urban, 1929, 164 p.
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3. éd. Paris, Maloine, 1929, 298 p.
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sans médicaments.
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Berlin, Berlinische Verlagsanstalt, 1929, 302 p.
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N. Y. academy of medicine...
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- Schulhof, F. Schizo-Phrenie. Schizo-Bulie.
Leipzig, Deuticke, 1928, 108 p.
- Selbert, N. Home care of the sick.
Phil., Saunders, 1929, 156 p.
- Simpson, W. M. Tularemia.
N. Y., Hoeber, 1929, 162 p.
- Stern, W. M. & Fourche, R. Tactique opératoire des voies biliaires.
Paris, Doin, 1929, 288 p.
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Berlin, Springer, 1929, v. 1.
- von Trauwitz-Hellwig, J. Urmensch und Totenglaube.
München, Bayerische Druckerei & Verlagsanstalt, [1929], 195 p.
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Paris, Maloine, 1929, 80 p.
- Watson, J. B. Psychology from the standpoint of a behaviorist.
3. ed. Phil., Lippincott, [1929], 458 p.
- Weissenbach, R. E. J. & Françon, F. Causes et traitements des rhumatismes chroniques.
Paris, Doin, 1928, 342 p.

PROCEEDINGS OF ACADEMY MEETINGS

OCTOBER

STATED MEETINGS

Thursday Evening, October 3, at 8:30 o'clock

I. EXECUTIVE SESSION

Election of Fellows and Honorary Fellows

THE FIRST HARVEY LECTURE

The regulation of water metabolism (lantern slides)
(lecture to be delivered in German)

ERNST PICK

Professor of Pharmacology, University of Vienna

G. Canby Robinson, President Harvey Society; Dayton J. Edwards,
Secretary Harvey Society

This lecture takes the place of the first Stated Meeting of the Academy for October.

Thursday Evening, October 17, at 8:30 o'clock

(Program arranged in conjunction with the Annual Graduate Fortnight)

I. THE WESLEY M. CARPENTER LECTURE

The function of the emotions in the production and prognosis of diseases, Charles P. Emerson, Professor of Medicine Indiana University School of Medicine, Indianapolis

II. Insomnia and disturbances of sleep, Carl Pototzky, Director, Nervous Children's Clinic Kaiserin Augusta Viktoria Haus, Berlin

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, October 1, at 7:45 o'clock

(Please note change of hour)

ORDER

I. PRESENTATION OF PATIENTS

Miscellaneous cases from various clinics

II. DERMATOLOGY IN BRAZIL

Howard Fox

III. DISCUSSION OF CASES

IV. EXECUTIVE SESSION

NOTE: Examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, October 4, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

- II. PRESENTATION OF CASES
 - a. Cases illustrating second paper of the evening, Grant Pennoyer
 - b. Same, Walter Galland (by invitation)
 - c. Same, Kenneth Lewis
- III. PAPERS OF THE EVENING
 - a. Post-operative shock and shock-like conditions; treatment by infusion in large volume, William MacFee, Robert Baldridge (by invitation)
 - b. The injection treatment of varicose veins with report of 200 cases, Grant Pennoyer
- IV. GENERAL DISCUSSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, October 8, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. Some factors probably concerned in the pathogenesis of multiple sclerosis, Richard M. Brickner (by invitation)
Discussion, Frederick Tilney, Leon H. Cornwall
 - b. Experiments on demyelination. The identity of hemolysins and myelolysins, Arthur Weil, Chicago
Discussion, Leon H. Cornwall
 - c. The reflex activities of the decerebrate animal, Lewis J. Pollock, Chicago (by invitation), Loyal Davis, Chicago (by invitation)
Discussion, F. H. Pike (by invitation), Frederick Tilney
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

The meeting of the Section of Pediatrics will not be held on the regular meeting date, October 10. Instead there will be a joint meeting with the Philadelphia Pediatrics Society and the New England Pediatric Society in Boston, October 26, the detailed program for which will be announced in the second folder of the month.

SECTION OF OTOTOLOGY

Friday Evening, October 11, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. The non-surgical dry treatment of suppurative otitis with iodine powder, Moses D. Lederman
 - b. The modified radical operation, Morley T. Smith
Discussion opened by John R. Page

SECTION OF MEDICINE

Tuesday Evening, October 15, at 8:30 o'clock

I. PAPERS OF THE EVENING

- a. Inorganic and organic factors in hemoglobin regeneration in experimental anemia due to hemorrhage, George H. Whipple, Professor of Pathology, University of Rochester (by invitation)
- b. Pathogenesis of secondary anemia, Charles A. Doan, Rockefeller Institute for Medical Research (by invitation)
- c. The etiological relationship of achylia gastrica to pernicious anemia, William B. Castle, Thorndike Memorial Laboratory, Boston (by invitation)

II. DISCUSSION

Nathan Rosenthal (by invitation), Florence Sabin (by invitation),
Lewis F. Frissell, H. S. Patterson

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, October 16, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

Carcinoma of the bladder; uretero-sigmoidal implantation; total cystectomy, Paul W. Aschner

III. PAPER OF THE EVENING

- a. Gonorrhea: A commentary upon our perplexities and the modern trends of thought and action, P. S. Pelouze, Philadelphia (by invitation)
- b. Discussion, Howard S. Jeck, William F. McKenna, Abr. L. Wilbarst (by invitation), Nathaniel P. Rathbun

IV. GENERAL DISCUSSION, Edward L. Keyes, Paul W. Ascher, Frederic Bierhoff, P. S. Pelouze

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, October 18, at 8:30 o'clock

ORDER

I. PRESENTATION OF CASES

A case of paralytic scoliosis with marked deformity treated by spine fusion and rib resection, Joseph Buckman (by invitation)

II. PAPER OF THE EVENING

A report of the recent joint meeting of the British and American Orthopedic Associations, Samuel Kleinberg

III. A model illustrating the method of treating a paralytic flat foot by a bone operation combined with transplantation of the peroneus longus, Leo Mayer

SECTION OF OPHTHALMOLOGY

Monday Evening, October 21, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. CLINICAL CASES
Hysterical amblyopia cured by riding in aeroplane, Guernsey Frey
- III. DEMONSTRATION
Colored ophthalmic photography with explanation of apparatus, Laurence D. Redway (by invitation)
- IV. PAPERS OF THE EVENING
 - a. The relation of the pathological laboratory to clinical ophthalmology. Illustrated, S. Hanford McKee, Montreal (by invitation)
 - b. The iridotaxis operation for primary and secondary glaucoma, George H. Bell

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, October 22, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. Presentation of new stethoscope for auscultating fetal heart beats, M. Leff (by invitation)
Discussion, H. Halsted, George L. Brodhead
- III. CASE REPORTS
A case of ruptured uterus following attempted version, with complete recovery of the mother and a living child, M. F. Goldberger (by invitation)
Discussion, H. Halsted, A. J. Rongy
Caesarean section and supra-vaginal hysterectomy under spinal anesthesia, Samuel S. Rosenfeld
Discussion, A. J. Rongy, George L. Brodhead, A. M. Hellman
- IV. PAPER OF THE EVENING
Symptomatic observations on one hundred cases of ectopic gestation with severe intra-abdominal hemorrhage; and the technique of auto-hemofusion, James V. Ricci (by invitation)
Discussion, Harbeck Halsted, Wm. M. Ford
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, October 23, at 8:00 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
(From Cornell Clinic)

- a. Chronic frontal sinusitis. Female, 41. Acute exacerbation with perforation into orbital cavity. X-Ray findings. Operation. Recovery, Thomas J. Garrick
- b. Bronchial asthma of infectious type. Male, 6; complained of persistent asthma for three months. One bilateral antral irrigation. Complete relief
- 2. Recurring nasal polypi. Female, 45; treated with radium; marked improvement, Anne M. Belcher (by invitation)
- c. Antrum tumor. Female, 32; pain in left cheek, nasal obstruction and discharge. Transillumination, X-Ray, biopsy—Report—Radium treatment—Result, well, Wm. J. Jackson (by invitation)

III. PAPERS OF THE EVENING

Symposium:—Treatment of suppurative disease of the maxillary sinus

- a. Surgical anatomy, Harry Neivert (by invitation)
- b. Conservative treatment, Harmon Smith
- c. Intra-nasal operation, Charles J. Imperatori
- d. Radical operation, E. Ross Faulkner
- e. Management of alveolar fistulae, H. S. Dunning

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

THE NEW YORK PATHOLOGICAL SOCIETY

(Under the auspices of The New York Academy of Medicine)

Thursday Evening, October 24, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Nephrosis in multiple myelomata, David Perla, Laurence M. Hutter (by invitation)
- b. Composition of spinal fluid after injection of novocaine for spinal anesthesia. (Lantern slides), Alfred H. Iason, Morris Steiner (by invitation)
- c. Adenomyosis of urinary bladder, Alfred Plaut
- d. An unusual tumor of the spinal meninges; case report, Leila C. Knox
- e. Acute hemolytic anemia. Three additional cases with a review of the literature. (Lantern slides), Max Lederer
- f. Balantidium coli enteritis, report of a case observed in New York City, Herbert Lampert (by invitation)
- g. Fibrosarcoma of the pleura in its relation to pleural endothelioma, C. V. Rabin (by invitation)
- h. Diverticula of small and large intestine, Robert P. Wallace (by invitation)
- i. Chloroform content of the brain and time of its disappearance from the brain after anesthesia. An important factor in a medico-legal case, Alexander O. Gettler, Ph.D. (by invitation)

SECTION OF PEDIATRICS

The Section of Pediatrics will unite with the Philadelphia Pediatric Society and the New England Pediatric Society in a joint meeting to be held in Boston on October 26. The program will be mailed to Section members.

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

(Under the auspices of The New York Academy of Medicine)

Wednesday Evening, October 16, at 8:15 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Composition of bone. Equilibration of serum with CaHPO_4 , M. J. Shear, Benjamin Kramer
- b. Pathological changes in viscosity of blood serum, Ella E. Fishberg
- c. Irreversible character of the late changes after hepatectomy, P. D. McMaster, D. R. Drury
- d. Relation of pH value of medium to selective bacteriostatic action of dyes, John W. Churchman
- e. The use of equations of the nth order to describe the action of simple haemolysins, Eric Ponder, J. F. Yeager
- f. Electrodialysis as a means of characterizing ampholytes, R. R. Williams, R. E. Waterman
- g. Further consideration of transmissibility of human upper respiratory infections (common cold) to the ape, G. S. Shibley, K. C. Mills, A. R. Dochez
- h. A rapid precipitation test for syphilis, L. Rosenthal

FELLOWS ELECTED NOVEMBER 7, 1929

Edward S. Godfrey, Jr.....	Dept. of Health, Albany
Jerome M. Lynch.....	205 East 61st Street
Madge C. L. McGuinness.....	3 East 85th Street
Edward M. Nash.....	57 Madison Street
Matthew Shapiro.....	1125 Park Avenue

AND FOR ASSOCIATE FELLOWSHIP:

Louise Stevens Bryant, Ph.D.....	23 Midland Avenue, Bronxville
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RESOLUTIONS OF THE COUNCIL ADOPTED OCTOBER 30, 1929

DR. REGINALD H. SAYRE

Since the last meeting of the Council, Dr. Reginald H. Sayre, an honored Fellow of The New York Academy of Medicine, has departed this life.

Dr. Sayre was elected a Fellow of the Academy in 1887. He was Treasurer of the Academy from 1906 to 1917, Vice-President in 1919. Dr. Sayre was instrumental in obtaining a donation of \$10,000 from Mrs. Edward N. Gibbs and her daughter which is now known as the Gibbs Prize Fund. Since the creation of this Fund, Dr. Sayre has acted as Chairman of a Committee to award the income of the Fund for research in diseases of the kidney.

Dr. Sayre had a long and honored career in orthopedic surgery in which he was interested from his youth on account of the important work performed in this field by his honored father, Dr. Louis A. Sayre.

The Council of The New York Academy of Medicine hereby records its sense of loss in the death of Dr. Sayre and instructs the Secretary to send a copy of this minute to the family of Dr. Sayre and directs that it be published in the Bulletin of the Academy.

DR. MARIN T. TUFFIER

The Council of The New York Academy of Medicine learns with deep regret of the death of Dr. Marin Theodore Tuffier, who was elected an Honorary Fellow of this Academy in 1926.

Dr. Tuffier was one of the foremost surgeons in France and had been physician to the hospitals of Paris for over forty years. He was an inspired teacher and leader in his field and developed many advances in the technique of operations. His work as consultant surgeon during the World War brought him the gratitude of the French nation which conferred upon him the order of Grand Officer of the Legion of Honor. His reputation was not only national but international. His merit had been recognized by many of the leading surgical societies in the world. Be it therefore

RESOLVED that the Council of The New York Academy of Medicine hereby records its deep sense of loss in the death of Dr. Tuffier, and further

RESOLVES that a copy of this minute be read before the Stated Meeting of the Academy and transmitted to Dr. Tuffier's family, and that a more extended note be published in the Academy Bulletin.

DEATHS OF FELLOWS OF THE ACADEMY

It is with regret that The New York Academy of Medicine announces the death on October 27, 1929, of Dr. Marin Theodore Tuffier, 42 Avenue Gabriel, Paris.

Born in Bellême, France, March 26, 1857, Dr. Tuffier received his degree of Doctor of Medicine in Paris in 1885, having served his apprenticeship in the hospitals of Paris from 1879. He was Prosecuteur of the Faculty of Medicine in Paris in 1882, Surgeon of the hospitals of Paris in 1887, Adjunct Professor of the Faculty of Medicine in 1889. He was Officer of the Academy, and Grand Officer of the Legion of Honor. Dr. Tuffier received honorary membership in many important medical societies abroad, among them the Belgian Society of Surgery, the Surgical Society of Bucarest, the Italian Society of Obstetrics and Gynecology and the Imperial Society of Medicine in Constantinople. He was in charge of the complementary courses in experimental surgery at the Hôpital Beaujon, *Professor Liber* of experimental operative medicine in the Academy of Sciences and was an Honorary Fellow of the American Medical Association and of the American College of Surgeons.

He was elected to Honorary Fellowship in The New York Academy of Medicine on November 18, 1926.

FREDERICK SEYMOUR WEINGARTEN, M.D., 310 West End Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1907; elected a Fellow of the Academy November 3, 1910; died, September 19, 1929. Dr. Weingarten was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. V.

DECEMBER, 1929

No. 12

ANNUAL GRADUATE FORTNIGHT

*Functional and Nervous Problems
in Medicine and Surgery
October 7 to 19, 1929*

ADDRESS OF WELCOME

JOHN E. JENNINGS

Vice-President, The New York Academy of Medicine

In the absence of the President, Doctor Hartwell, and speaking for him and for the Academy, it is with great pleasure that I offer to you all, invited guests and visitors, our welcome to the exercises of this the Second Annual Graduate Fortnight.

One year ago the Academy began what Doctor Samuel Lambert, then its President, described as an experiment in graduate medical service without previous experience, a Graduate Fortnight, devoted to conferences, lectures, demonstrations and clinics arranged by the Committee on Medical Education of the Academy and concerned with the problem of Ageing and the Diseases of Old Age.

Our expectation of success was as you know more than vindicated and this the Second Annual Graduate Fortnight, was, as it were, predestined to continue the effort then begun. The initiation of these fortnights was an experiment, so experimental indeed that the exact nature of the experiment has to be explored. I wonder if a succession of such fortnights will reveal in New York any

similarity to conditions in graduate education as we have found them in Brooklyn, for over there we have been engaged also in an experiment and an attempt to interpret its results.

The enterprise began some seven years ago and consisted in the coöperation of the Medical Society of the County of Kings and the Long Island Medical School in courses of late afternoon lectures on subjects of direct clinical interest to the practitioner and in offering in conjunction with several hospitals of the Borough short courses in a matter of more or less practical medical and surgical subjects. It has been successful and is still going on. The lectures are regularly crowded and the extension lectures have had a varied popularity. In general a registration equivalent to about one-fifth of the medical population has taken one or more of the courses offered. This is not the time nor the place to discuss in any detail the reasons for the degree of its success nor the obstacles to its greater glory. Two striking facts, however, seem to make themselves clear.

First, a certain separation which exists between the school and the profession who seem in a measure to have lost touch with one another; and, secondly, a gradual but very definite and progressive decay in the older methods of training by apprenticeship with loss of some of its virtues.

The profession has at its disposal many opportunities for graduate conference and study most of which, however, are more or less special and technical in their aspect. It has seemed wise to the Committee on Medical Education of the Academy to select this year a subject of broad and general interest to the physician and layman as well. I have no doubt that as a result of the discussions that we are now to begin, some sense of necessity and some clarity of purpose will enlarge to guide us in an attempt to solve some of the problems that face us all.

It is a great pleasure to express the thanks of the Academy to the many speakers from near and far who are sharing the activities of the Fortnight and to the hospitals and medical schools and their staffs for their coöperation with the Committee on Arrangements. One cannot but admire the courage of the Committee on Education in its choice of a subject. Thrown almost as a challenge it would seem, what will the discussion disclose? Will it reveal consistent agreements as to the nature of the functional problems of many of our patients? Will it help us to recognize certain functional disorders in medicine and surgery themselves?

THE GRADUATE FORTNIGHT *

HARLOW BROOKS

Visiting Physician, City Hospital

Mr. Chairman, our distinguished guests and our colleagues and friends: Dr. Kast was to have addressed you this evening on the subject of the Graduate Fortnight. He was going to attempt to explain to you and Dr. Far-
rand just exactly what our purpose is in this Fortnight which we are giving and inaugurating tonight for but the second time.

Our purpose is, as all doctors know, to improve the facilities for post-graduate education in medicine in the broadest possible sort of way.

Most unfortunately Dr. Kast was unable to meet your engagement tonight because of illness and somewhere on the high seas I must have passed Dr. Kast on his way to Europe, myself on my return to America where I arrived yesterday afternoon. This evening I received a very lovely letter from Dr. Kast telling me what I was to do tonight. It is apparent to you then my preparation to fill a very large, spiritually speaking, not physically, pair of shoes

* Delivered October 7, 1929.

has been very brief and I shall try to please you in at least one thing, by being very brief.

My close familiarity with the work of this Committee, of which I have been a member ever since these Fortnights have been discussed and inaugurated, and my close familiarity with Dr. Kast both as a colleague and a friend has left me able to express at least in my inadequate way what his ideas and the ideas of the Committee, and I hope of the Academy, are in regard to post-graduate education and our purpose in this special affair, the Graduate Fortnight.

Every student and every physician realizes the little we can give to the undergraduate student of medicine, at the best it can only suffice to show him a trail to the study of medicine, to present the young student with some of the elemental tools of his trade, perhaps to train him sufficiently in technique so he can go on with the real study of disease and humanity. The succeeding years spent in the hospital, two, four or eight, or as it may be, as a rule but show the student his frailties and his shortcomings, but they do whet his appetite and stir his ambition for the study of medicine which must last through his lifetime and which properly starts after he has left the hospital and engaged in the actual practice of medicine.

It is too often a dreary and discouraging prospect for the young physician when he leaves his wards where his work has been for several months or years closely supervised, organized and directed. If he go on now out into practice much of his time and attention must be directed to social and human problems of which his college and hospital have usually shown him little, too little. Yet these phases of medical practice are essential as they are obligatory at least for the many who must be dependent upon practice for their living.

I am much of the mind that no man is a true clinician until he fully comprehends the human being who is the patient, as well as the disease with which the patient is

afflicted. This has perhaps a slight bearing on the problem which we are bringing before you in the coming two weeks.

Since this is so and since the studies of disease and humanity are but begun in school, the more must we realize that the true physician must remain forever a student.

Systematized post-graduate instruction needs no excuse before the American practitioner. There are practically no physicians who do not need and desire it, and I am certain that I am entirely correct in the statement that he who feels that he requires it least really requires it most.

Unfortunately, as yet we have not properly developed the facilities for post-graduate medical instruction in this country, but the European clinics are chiefly packed with our men, and I am sure that all of us agree that it is unfortunate that so few of the hospitals and of the hospital physicians of America are willing or perhaps prepared to supply this urgent local need.

Fortunately, however, this is rapidly being compensated for by the establishment of post-graduate instruction now in most of the large centers of medical study and it is no doubt true that within a few years at the latest we shall find connected with every medical center excellent facilities for post-graduate instruction.

Our experience in undergraduate education has shown us that both undergraduate and post-graduate instruction must be systematized and organized, the one as carefully as the other.

In considerable part it may be that this organization may be undertaken by universities, perhaps by a graduate department of an undergraduate medical college, but at best this is not entirely satisfactory because of the inaccessibility for the distant practitioner who needs it most, to the great metropolitan centers, where only large institutions of undergraduate instruction may and should exist.

We must in considerable part rely on instruction given in the hospitals widespread throughout the land. Every hospital should consider as a part of its public obligation the giving of instruction so the possibility of post-graduate study in medicine may be offered to every ambitious practitioner. I was proud to read in London the other day an excerpt from a New York paper which told me that New York has at last waked up to the fact that a hospital should be something more than a mere house for the sick. It must be also a school for our instruction and for the progress of medical science which is the same thing exactly and in no way different than the progress of humanity in general.

The organization for such courses may in some part be borne by universities or undergraduate schools, but in many places this is not a sufficiently elastic process, especially for the outlying localities, far from great schools. It remains then for the greater part of this burden to be carried on by the profession itself, as represented chiefly in the various medical societies. The advance of medicine has always largely originated from such institutions, never from lay support.

This plan which is being rapidly developed throughout the entire country has in most instances worked out most happily. One need but mention the splendid efforts in this direction carried out by the American College of Surgeons, the American Medical Association, the Canadian Medical Association, the Interstate Post-Graduate Medical Association, by the numerous special associations—the nose and throat men, the ophthalmologists, and to cross a narrow river to a not far distant town one may go to Brooklyn and see what has been done there in the way of post-graduate education, and the new spirit and the new life which has been fused into every practitioner as the result of that work.

All of you know that the Academy of Medicine has during the past few years devoted a large part of its energies to this purpose. What it is doing for medical in-

struction in New York City, through its Educational Committee is being extended at least in part, throughout the entire State, in conjunction with the state and county medical societies.

The plan of the Graduate Fortnight has been formulated by this Committee as a part of this program and it is the purpose of the Academy to extend the benefit of the post-graduate facilities of this great City to all who may choose to come and take part in these meetings. At the present, we can only offer two weeks. Perhaps later we may offer you more. We also plan to extend our most active assistance to every organization throughout the entire land which is interesting itself in this most insistent demand for post-graduate medical instruction. Many plans are under consideration. Were Dr. Kast able to speak to you tonight he planned to present to you an entirely feasible project, designed to bring this thing about, one might almost say, a world-wide project. I do not feel that I should attempt to more than declare our object tonight, and on the part of the sub-committee to welcome you to our Second Graduate Fortnight.

SUMMARY OF THE EXTEMPORANEOUS ADDRESS ON THE ORIGIN AND GROWTH OF THE MENTAL HYGIENE MOVEMENT *

MR. CLIFFORD W. BEERS

Founder and Secretary of *The National Committee for Mental Hygiene*
and of *The American Foundation for Mental Hygiene*

Mr. Beers prefaced his remarks by alluding to the time, some twenty years ago, when the discussion of a mental hygiene or psychiatric topic at a medical meeting was a

* At the request of Mr. Beers only a summary of his remarks on October 7 is herewith published because so many of the incidents related by him in his talk are presented in a more interesting and carefully worded way in his autobiography, "A Mind That Found Itself."

rare occurrence. The present Graduate Fortnight, devoted entirely to the mental and nervous aspects of medical problems was, therefore, he said, a most significant event, thanks to the developments that have taken place since the inauguration of the mental hygiene movement and the rapidly growing interest shown in mental hygiene not only by the medical profession but among all classes of people. The lack of this interest on the part of physicians generally before the importance of mental hygiene was recognized, the speaker suggested, was undoubtedly an important contributing factor to his own misfortune as a victim of mental disorder, in that it effectually prevented him from receiving in the early stages of his illness the proper care and treatment that might have averted a complete breakdown and rendered unnecessary a protracted period of residence in hospitals for the mentally ill.

Mr. Beers referred to his autobiography, "A Mind That Found Itself," which describes his hospital experiences, the publication of which led to the founding of The National Committee for Mental Hygiene. Paradoxically, he said, this organization might not have been founded, certainly not by him, had the medical schools been teaching psychiatry thirty to forty years ago. That the situation in this respect has materially improved, he said, is evident from the development of such medical services as the Department of Mental Hygiene at Yale University and in other educational institutions in this country. Had such a department existed at Yale when Mr. Beers was an undergraduate (in the eighteen nineties) his breakdown might have been prevented, according to the opinion of psychiatrists familiar with his case.

While the teaching of psychiatry in medical schools has been considerably extended in recent years, Mr. Beers continued, there is still a great need for stimulating interest in mental and nervous diseases on the part of the general practitioner, as even now instances of the neglect of individuals heading for mental breakdowns, due to a lack

of knowledge regarding the nature of mental conditions on the part of family physicians, come to the attention of the National Committee from all parts of the country. However, the very fact that these unfortunate people, directly or through their families, appeal to the National Committee and to State Societies for Mental Hygiene for help in their difficulties, the speaker said, was an indication that the mental hygiene activities of the past twenty years were having pronounced educational effect and that these organizations were achieving one of their principal aims, in that it is now possible to put these people in contact with psychiatrists who can give them the advice and treatment they need. Mr. Beers also counted it a gain to know that in many more instances, today, the general practitioner at least recognizes the true character of his patient's condition and, if he cannot himself manage it, knows where to refer the case for the necessary study and treatment. The present series of meetings, therefore, constitute a notable contribution toward the spread of knowledge concerning mental and nervous disorders within the medical profession, for which The National Committee for Mental Hygiene and affiliated societies are deeply grateful.

Indicating the magnitude of the problem of mental diseases, Mr. Beers pointed out that there are today approximately 300,000 persons under care in mental hospitals, or more than there are patients at any one time in all of the general hospitals of the country combined. The 1928 hospital census of the American Medical Association showed that 1 out of every 325 persons in the United States was a patient in an institution for nervous or mental disorders (including the feeble-minded and epileptic), while only 1 out of every 2,406 persons was a patient in a tuberculosis hospital. Twenty years ago when the mental hygiene movement started, there were approximately 187,000 patients in mental hospitals. The great increase, the speaker said, was due, not to any actual rise in the rate of mental cases developing in the American population that could be statistically established, but to

the far greater provisions existing today for the care and treatment of these cases, and to the fact that, thanks to the educational influence of the mental hygiene movement, people suffering from mental disorders are seeking admission to mental hospitals in greater numbers than ever before. There is no longer in most families the same reticence or sense of shame that there used to be over the occurrence of a mental case within the family circle, and this change in the public attitude toward insanity has had a beneficial effect on the whole situation, by helping to bring the problem of mental disorders as it actually exists in this country to the surface, and therefore making it easier to deal constructively with it.

With more adequate hospital facilities for cases in need of active treatment, it is possible to think and act more effectively in terms of prevention through the establishment of such mental-health services as psychiatric or mental hygiene clinics, child guidance clinics, college and school departments of mental hygiene and other centers of advice and treatment for those suffering from or in danger of developing mental troubles. In the opinion of conservative specialists in mental disease, about half of all cases of mental or nervous disorder could be prevented by the timely application, largely in childhood and adolescence, of knowledge already available. Effective ways of applying this knowledge on a nation-wide scale have been worked out by The National Committee for Mental Hygiene and progress is already being made in the schools and colleges, in industry and in the community generally.

A gratifying indication of the progress that is being made in preventive mental hygiene work in the community; the speaker said, was the fact that there are today nearly 500 mental clinics providing regular service to the public for the study and treatment of children, over 300 of these clinics having come into existence since 1922, whereas twenty years ago, when the movement began, there were almost none. As an example of the development of community interest in the possibilities of a mental hygiene

program, he mentioned the recent establishment of a child-guidance clinic in Niagara Falls, New York, under the terms of the will of the late Mrs. Martha H. Beeman of that city, who left a fund of \$400,000 for child welfare. After months of study of the various ways in which this money might be used, it was decided by the executor to devote the entire fund to child-guidance work. The plans for the clinic have not only been worked out under the direction of members of the staff of The National Committee for Mental Hygiene but that Committee, under the deed of trust, is to serve in a continuing capacity as special adviser on plans, policies and personnel.

Mr. Beers closed his talk with a brief description of the National Committee's activities, of the plans for the First International Congress on Mental Hygiene, which is to be held in Washington, D. C., from May 5th to 10th, 1930, and of The American Foundation for Mental Hygiene, recently incorporated by a group of officers of the National Committee for the purpose of serving as custodian and administrator of gifts and bequests for use in financing mental hygiene work and agencies in all parts of the field.

THE INVOLUNTARY NERVOUS SYSTEM *

WALTER LANGDON BROWN

Physician to St. Bartholomew's Hospital, London

I come to you from the oldest hospital in the English speaking world; six years ago we celebrated our 800th anniversary. In a sense our hospital is the direct grandchild of the original temple of Aesculapius at Epidauros, whence the Romans brought the statue of the god when they founded a temple of healing on Tiber Island. In Christian times this temple became the hospital and the Church of San Bartolomeo, and it was while a patient here that Rahere conceived the idea of erecting the Hospital

* Delivered October 8, 1929.

and Church of St. Bartholomew's in London. The Hospital and Church still stand in Rome on Tiber Island; the Church of St. Bartholomew the Great was one of the five churches that escaped the great fire of London, and in the adjoining hospital the work of healing has not ceased these eight hundred years.

It is interesting to recall that the main features in the cult of Aesculapius were cleanliness, fresh air, psychological explanation, suggestion and dream analysis, so that the medicine of the 20th century has shown a striking tendency to return to the original cult.

As a representative of that grandchild of the original temple it is a great pleasure to me to come to this dignified and beautiful new temple, dedicated to Aesculapius, where the traditional and the progressive elements of medicine are so happily blended.

When I was invited by this Academy to participate in your Graduate Fortnight I naturally appreciated the honour very highly, but when I saw the list of distinguished men who were also to lecture I began to wonder what contribution I had to offer which they were not in a much better position to make than I. Then remembering that the topic of the Involuntary Nervous System was allotted to me, I reflected that there could not be many physicians still practising who had actually worked under both Gaskell and Langley at the time they were engaged in their researches on this subject, and who had had the opportunity of seeing the results gradually unfolded. It therefore occurred to me that it might be of interest if I gave you my impressions of those researches in the making, before turning to their subsequent clinical applications. For they stamped themselves deeply on my mind as a young man, and have greatly influenced the subsequent trend of my clinical ideas.

Gaskell and Langley were two of the earliest group of distinguished men that Michael Foster gathered round him when he went to Cambridge. It is a curious and interest-

ing fact that two such different characters should, starting from such different standpoints, have reached convergent and confirmatory results.

Gaskell was essentially a big man, alike in physique, personality and character. He poured out ideas with unstinted prodigality, often giving them to his pupils to develop and to take the credit for. He delighted in sweeping generalisations in which, though they were sometimes based on inadequate detail, he was guided aright by his philosophic insight.

Langley, small and trim with a steely blue eye which had a strangely hypnotic effect on many people, excelled in exact, meticulous, careful detail, preferring to work behind closed doors until he was sure of his results and then demonstrating them with a cool, incisive precision.

Gaskell had worked with Ludwig and had been primarily interested in the cardio-vascular system. His studies on the rhythm of the heart and on vaso-dilatation led him to study the vago-sympathetic trunk to the frog's heart and through that, the involuntary nervous system in general.

Langley had worked with Heidenhain and was engrossed in the histology of secretion, particularly the secretory granules as the forerunner of the characteristic secretion of the gland. This led him to the study of the influence of the chorda tympani and the sympathetic on the secretion of the submaxillary glands. He became intrigued by the "paralytic secretion" which follows section of the chorda tympani, but seemed to reach a dead end here, until in conjunction with Dickinson he discovered the paralysing effect of nicotine on the pre-ganglionic sympathetic nerve endings. He was quick to grasp the opportunity this gave him to unravel in detail the distribution of the sympathetic nerve fibres. Patiently, unremittingly he laboured for years till the whole plan was clear.

But it is always the great explorer in unknown territory who claims our allegiance and fascinates our imag-

ination. To you the names of Columbus, Amerigo Vespucci and Cabot mean more than that of a skilled investigator in the latest geographical survey of your continent. And so to me the great sweep of Gaskell's mental telescope was more stirring than the splendid accuracy of Langley's mental microscope. Moreover, Gaskell's work should claim our first attention since in point of time it came first.

To read an account of the sympathetic nervous system before Gaskell is like reading an account of the circulation before Harvey. Both of these great observers reduced chaos to order. Looking back it is difficult to realise that before Gaskell the actual course of the impulses in the cervical sympathetic was not understood. And the starting point, as I have already hinted, was the recognition that the vagus nerve to the frog's heart was really a combined vago-sympathetic trunk; the sympathetic part of which joined the other at the vagus ganglion. It therefore appeared that the impulses in the cervical sympathetic ran upwards into the neck, *i.e.*, towards and not away from the brain, and he soon traced the outflow of the cardiac fibres to the anterior root of the 3rd spinal nerve, whence they passed by the white ramus communicans to the sympathetic chain.

Whereas previous observers had obtained divergent results from stimulation of what he showed was a mixed nerve trunk, he found that if the vagus and sympathetic were stimulated before they had united the results were constant, the vagus producing inhibition and the sympathetic acceleration. He also showed that this inhibition was essentially an anabolic process, since the subsequent heart beats were more powerful and capable of overcoming a previous heartblock, while the acceleration was essentially a katabolic process, since the subsequent beats were feeble and a partial heartblock became more complete. This view of inhibition as protective and conservative in character is one which has had an important influence in physiology and psychology alike. I sometimes wonder

whether my fellow-student of those days, Prof. Wm. McDougall, did not have his interest in inhibition originally aroused by Gaskell's work. At any rate, it was the subject of one of his earliest papers.

Coming to the mammal, Gaskell found a closely similar origin for the inhibitory and accelerator fibres to the heart, though they remained separate throughout their subsequent course. The sympathetic or accelerator fibres were shown to spring from the 2nd and 3rd thoracic anterior nerve roots. Cutting sections of these nerve roots central to the white ramus he found that they contained two different types of fibres, markedly differing in calibre, and that all the fibres of small calibre passed into the white rami, while the anterior root beyond this point contained only large fibres. But a section of a cervical root which had no white ramus had only large fibres. His mind quickly grasped the significance of this—somatic nerve fibres are of large calibre, visceral nerve fibres are of small. Here to his hand was a method of determining the general plan of the involuntary nervous system. The weapon with which this observation supplied him was a simple one, but what a tremendous use the mind that wielded that weapon proceeded to make of it. Applying this test, he showed that fibres of small calibre left the spinal cord by every anterior root between the 2nd thoracic and the 2nd lumbar. Above and below this came a break where the great nerve plexuses to the limbs originated; here only large fibres were to be seen. But above the brachial plexus and below the lumbar plexus small fibres were again to be seen, above in the vagus and certain other cranial nerves, below in what we now call the pelvic visceral nerve. All these small fibres had visceral function, though evidently different in function to the thoracic lumbar outflow; indeed when they were distributed to the same structures the functions of the two were directly antagonistic.

Thus the first great generalisations as to the involuntary nervous system were reached. (1) It was shown to con-

sist of an outflow of small medullated nerves occurring—
 (a) From all the anterior roots between the two great limb plexuses—this constituting the true sympathetic outflow.
 (b) Above and below the limb plexuses—this constituting what is now usually called the parasympathetic. (2) Whatever the destination of these fibres, their origin was always restricted to these areas. (3) Whenever sympathetic and parasympathetic fibres supplied the same structure their effects were antagonistic.

Turning to the consideration of the cells from which these fibres originated he concluded by a process of deduction, and without the histological aids subsequently devised by Golgi and Ramon y Cajal, that the sympathetic fibres sprang from the cells in the lateral horn of the spinal grey matter, and that the parasympathetic fibres came from cells in a closely analogous position. The complete segmental nerve was not composed of two but of three parts, afferent, efferent and visceral, but in the elaboration of the brain the segments had undergone fusion and readjustment, so that the arrangement was more complicated. This led him to the recognition of the existence of afferent visceral nerves. Edgeworth, working under him, traced some of the few fibres of larger calibre in the white rami to the Pacinian corpuscles in the cat's mesentery, obviously sensory structures. He therefore extended his conception of a complete segmental nerve thus (1) a somatic part containing efferent and afferent fibres, and, (2) a visceral part also containing efferent and afferent fibres.

The development of highly organised limbs led to the corresponding parts of the spinal cord having to devote themselves exclusively to somatic functions, such visceral fibres as they needed having to be supplied from other regions of the central nervous system. The vertebrate body is fundamentally a tube within a tube, the inner tube being supplied by visceral, and the outer by somatic fibres.

This conception led him into a far more speculative field, the origin of the vertebrates. Many have deplored this.

diversion of his interest from a field in which he was supreme to one where he was at first relatively an amateur. It is not too much to say that morphologists actually resented his intrusions with revolutionary ideas into their preserves. It cannot be said that his views as to the origin of the vertebrates from an arthropod ancestor command general acceptance, but we cannot lightly neglect the mass of evidence he accumulated in favour of his theory during the remaining years of his life. At first strongly prejudiced against it by my training in the morphological traditions of Frank Balfour, Lord Balfour's brilliant brother, so early cut off, I have gradually become more favourably disposed to it, as it was found to anticipate subsequent anatomical discoveries, and to provide a reasonable explanation of the origin of the endocrine system, a system which was almost unknown when Gaskell first promulgated his theory.

This, I think, is about as far as we can profitably apply the historical method to Gaskell's work. The rest of it can be better treated as part of the more complete picture resulting from Langley's researches. It may seem to you that I have somewhat laboured several points of common knowledge, but I have done so in the belief that a more vivid impression can be derived from a study of the steps by which that knowledge was acquired.

Let us now turn to Langley. I should summarise his great contributions to the subject as (1) the proof that every sympathetic impulse has to pass first through a pre-ganglionic medullated fibre and then through a post-ganglionic non-medullated fibre, (2) the discovery of pilomotor fibres which enabled the segmental distribution of visceral fibres to the skin to be demonstrated, (3) the generalisation as to the action of adrenalin in connection with the sympathetic. I will deal with each in turn.

Together with Dickinson he found that if he painted a solution of nicotine on a sympathetic ganglion certain fibres were paralysed and others were not. He soon realized that those which were thus affected were the ones

some reiteration, this really is an exception which proves the rule. For the chromaffin cells of the adrenal medulla are nervous in origin. Not only anatomically but phylogenetically, embryologically and functionally the adrenals and the sympathetic are in the closest association. Strictly speaking, in the adrenals the chromaffin cell represents the post-ganglionic element. The principle of wide diffusion of sympathetic impulses is here carried to a triumphant conclusion, for the lower neuron of a particular part of the sympathetic is transformed into a glandular structure whose secretion reproduces all the sympathetic effects when it is carried into the circulation.

I hope that by stating it in this way I can avoid the controversy as to the emergency action of adrenalin, though it must be obvious that my sympathies are with Cannon rather than with Stewart and Rogoff in that matter. But, in passing, I cannot refrain from pointing out that in the relationship of the hypothalamus, often regarded as the head ganglion of the sympathetic, to the pituitary gland, we have a similar example of an originally nervous structure acquiring a secretory function and being activated by the associated nervous tissues. I would call your attention to the recent Goulstonian Lectures, given by my former distinguished pupil Professor E. B. Verney, in which the position of the pituitary has been rehabilitated. In each of these endocrine glands we have a two-fold structure, one glandular throughout, the other primarily nervous but assuming secretory functions under the control of the involuntary nervous system.

And now let me return from this excursion into history to try and evaluate the biological position of the involuntary nervous system in the light of the researches I have detailed. When organisms were still of a lowly structure their life of internal relation was simple and could still be carried on by chemical mechanisms. But they required an "awareness" of their environment, a capacity to avoid danger and to seek food. Thus it happened that sensitive perceptive structures were first developed on the sur-

face of their bodies. Nervous structures are ectodermal in origin, but the nerve cells soon tended to withdraw themselves into a more protected position. The migration of the cell in the lower sensory neuron from a sub-epithelial position to one close to the spinal cord is an example of this. The invagination of the neural tube in the vertebrate embryo is merely a developmental short cut to the same end. For the simplest reflex action we require a receptor neuron and an effector or excitor neuron. But in the primitive nerve network in which the cells of such neurons reside a third type of cell develops, the adjustor or connector neuron which mediates between the two. This constitutes the first germ of a central nervous system, and we know that it is by the increase of the number of such association cells, as they are more usually called, that the increasing complexity of the central nervous system declares itself. Now there is a striking difference between the position of the connector units in the somatic and visceral nerves respectively. In the somatic nerves the immediate connector element is very short and entirely intraspinal, its cell being in the posterior horn and its axon arborising around an anterior horn cell. But in the visceral nerves the connector element is longer, starting from a cell in the lateral horn, its axon emerging with the anterior root and going by the white ramus to a sympathetic ganglion. In other words, the whole of the small medullated pre-ganglionic fibre is connector in nature, while the non-medullated post-ganglionic fibre is the effector element. The pre-ganglionic fibre announces its associative connector character, further in the way that it is operative over several effector elements at different levels, as already explained. As Bayliss put it: "Whereas the somatic nerves are formed by *axons* growing out of cells in the central nervous system, the autonomic system is formed by chains of *cells* growing out from the same system and forming axons subsequently."

The purpose of this different arrangement in the two systems is found in the different functions performed by them. The somatic nerves are for localised accurate reflexes, the visceral for wide-spread effects. That is the

secret of the arrangement of the sympathetic nervous system. And in this respect we shall find that this system retains a number of primitive features both structural and functional. Thus we have seen that the ganglion cell is primitively peripheral but is withdrawn either into or close to the central nervous system as evolution proceeds. The sympathetic ganglia remain peripheral. Again, the intestinal myenteric plexus which is in close association with the sympathetic nervous system recalls the anatomical arrangement of the primitive nerve net. Yet again, whereas connector neurons ordinarily become strictly confined to the central nervous system, the white rami of the sympathetic which are connectors lie almost entirely outside the central nervous system. As with structure, so with function. There is no discriminative sensibility in the sympathetic, its response is urgent, immediate, widespread and explosive, as are the responses of the primitive nervous system.

So far I have chiefly illustrated my argument from the sympathetic portion of the involuntary nervous system because its segmental arrangement is so much simpler. But we must always remember that it is only one part and not the whole of the involuntary nervous system. Langley introduced the term "autonomic nervous system" for the whole of this, and it is a good name, but unfortunately it has become used in two different senses. The term "vegetative nervous system" has also been suggested and widely adopted. But vegetative hardly seems an appropriate description of the violent, explosive reactions typical of this system. The term "visceral nervous system" seems hardly suitable to include the innervation of such skin structures as sweat glands and hair follicles. So the name selected for this lecture, "involuntary nervous system," seems open to least objection for the whole, "sympathetic" and "parasympathetic" being kept for its two main divisions.

There are certain features of general resemblance between the sympathetic and parasympathetic, with special features correlated with the functions subserved. They

both control functions of organic life and act apart from the will. They both arise from corresponding groups of cells in the grey matter with pre-ganglionic elements composed of small medullated connector fibres and conform to the rule that no connector impulse runs direct to muscle or glands but always ends in an arborisation round an effector element in a ganglion. The post-ganglionic non-medullated fibres do not in any case run to other nerve cells of the system, but are distributed to their peripheral destination, branching as they go. But the parasympathetic connector fibres have their cell station close to their destination, so that the effects produced through the post-ganglionic portion are more localised and less widely spread. Except for the pelvic visceral nerve, their segmental arrangement is obscured by the elaboration of the brain. The cranial portion of the parasympathetic sends fibres by the third nerve *via* the ciliary ganglion to constrict the pupil, by the seventh nerve to the chorda tympani *via* Langley's and the sub-lingual ganglia to the sub-maxillary and sublingual glands, and by the ninth nerve through Jacobson's nerve *via* the otic ganglion to the parotid gland, both of these being secretory in function. But the main cranial parasympathetic nerve is the vagus, which is distributed to the heart and alimentary canal with its outgrowth, *i.e.*, the lungs, liver, gall-bladder and pancreas. The cell stations for the cardiac fibres are in the heart itself, and those for the alimentary tract are found in Auerbach's plexus.

The effects of sympathetic stimulation are all designed to activate the body for a struggle and to increase its powers of defense (Cannon). The pupil dilates to increase the perception of light; the heart beats more quickly and more forcibly to supply the muscles with blood; the blood vessels in the visceral area constrict, raising the blood pressure there, thus altering the distribution of blood and driving it from the digestive area, whose functions are simultaneously inhibited, into the skeletal and cardiac muscles, the lungs and the brain. The blood sugar is increased to supply fuel to the muscles. The sweat glands are stimu-

lated to cool the body heated by its excessive muscular effort, and the hairs are erected in many animals to render them more alarming.

Turning to the effects of parasympathetic stimulation, we find that in general they replace the display of kinetic energy by the storage of potential energy. Cannon says: "A glance at the various functions of the cranial division reveals at once that they serve for bodily conservation: by narrowing the pupil they shield the retina from excessive light, by slowing the heart-rate they give the cardiac muscle longer periods for rest and invigoration; and by providing for the flow of saliva and gastric juice, and by supplying the muscular tone necessary for the contraction of the alimentary canal, they prove fundamentally essential to the processes of proper digestion and absorption, by which energy-yielding material is taken into the body and stored. To the cranial division of the visceral nerves, therefore, belongs the quiet service of building up reserves and fortifying the body against times of need and stress."

The sacral division of the parasympathetic consists of the pelvic visceral nerve. It may be regarded mainly as a mechanism for emptying. "Like the cranial division, the sacral is engaged in internal service to the body, in the performance of acts leading immediately to greater comfort."

Of these two great divisions then, the sympathetic is katabolic, directing the stream of energy outwards, while the parasympathetic is anabolic, directing the stream of energy inwards where it is stored up. When these two are distributed to the same structures their action is always antagonistic, and when one is stimulated the other is inhibited. Anrep has recently shown an interesting exception to the general plan of visceral innervation in the coronary vessels. Here the sympathetic is vaso-dilator while the vagus is constrictor. But this is again an exception which really coöperates with the general scheme. When there is a general vaso-constriction the blood pressure rises and the heart has to do more work, requiring

a better blood supply while this special vaso-dilatation provides. Conversely when the vagus inhibits the heart, blood pressure falls and since the heart is doing less work it requires less blood. Simultaneous vaso-constriction through the same nerve prevents a wasteful supply of blood to the heart.

The rhythm of life largely depends on the fluctuating balance between the sympathetic and parasympathetic. Thus fatigue following the expenditure of energy leads to sleep when the parasympathetic gains control, and the arrest of external manifestations of energy lasts until the balance is restored in favour of the sympathetic, when the subject awakens again. The predominance of the parasympathetic in sleep is further shown by the liability for parturition to start and for what one may call parasympathetic accidents to occur during sleep, such as asthma, enuresis and emissions.

We see, therefore, that in pain, fear, rage and any intense excitement the anabolic activities of the body are in abeyance, and the katabolic activities go on unchecked. Potential energy is converted into kinetic, and reserves are freely spent. This is comprehensible since these katabolic activities are defensive in origin and aided the primitive animal in its struggle with its antagonist; and that complex organism, the State, when at war, like the individuals of which it is composed, inhibits its anabolic activities, spends its reserves, and brings into play every katabolic activity which can aid it in its struggle for victory.

It may be asked, how, on this theory, is one to account for the parasympathetic effects that are seen in overwhelming pain or fear—collapse, syncope and loss of sphincter control? Rivers pointed out that a lowly organism has another method of defence—immobility—which takes the form in some animals of “playing dead.” Many animals, although able to perceive a moving object readily, seem to have little appreciation of a stationary one, that immobility may prevent detection. These two

ods of reaction—immobility and preparation for fight or flight—admit of no compromise. One or the other may be effective; to attempt to combine the two would be fatal. The “quoter none” principle is exemplified; either complete immobility through the parasympathetic or violent action through the sympathetic. Thus the confusion is avoided which would inevitably result from simultaneous response of both divisions. If one comes into action the opposing group is inhibited.

Each of these great divisions coöperates with a group of endocrine glands; the sympathetic with the adrenals, thyroid and pituitary, the parasympathetic mainly with the glands of the digestive organs and their annexes, and possibly with the parathyroids. Biologically we may look upon the endocrine glands as a specialisation of the old chemiotactic mechanism of control which is of more primitive origin than the nervous system. But the gonads, which date from the very beginning of the metazoa, also were originally entirely under chemiotactic control. This explains the persistence of the close association between endocrines and gonads, which can be demonstrated both embryologically and functionally. And since the sympathetic nervous system entered into a defensive and offensive alliance with the endocrine glands, a basic tripod came to be formed which was entrusted with the duty both of the preservation of the individual and the continuity of the species. If any one limb of this tripod becomes affected the balance of the whole is disturbed. There is a physiological disturbance of the balance initiated by the gonads at puberty, in pregnancy and at the climacteric, and it is notorious that the sympathetic nervous system may at those epochs experience a difficulty in re-establishing a balance. Pathological disturbances initiated in the same way are also sure to affect the sympathetic nervous system.

But before dealing with these clinical aspects we must briefly refer to the receptor channels of the involuntary nervous system. Although the parasympathetic nerve trunks apparently receive afferent fibres from all the or-

gans to which they send efferent fibres, this is not the case with the sympathetic which receives none from the body walls or limbs, nor from the head where it overlaps the bulbar parasympathetic. It receives relatively few from the region where it overlaps the pelvic visceral nerves.

In the thoracic and abdominal viscera most of the afferent fibres, which on electrical stimulation give rise to pain, pass by the sympathetic and not by the vagus. As already stated, large medullated afferent fibres can be traced from the Pacinian corpuscles in the cat's mesentery. The special features of the afferent nerves to the viscera were summarized by Langley thus:

(1) The healthy viscera give rise to little or no sensation when cut, probably because of the comparatively few sensory fibres in a given area. In pathological conditions, however, cutting may be painful and strong contraction may give rise to intense pain. (2) The localisation of pain is very imperfect. (3) In pathological conditions the viscera readily give rise to pain and tenderness in the body wall.

These points call for further consideration. Although secretory processes and the movements of the gut do not usually pass the threshold of consciousness our internal sensations send impressions to the brain which affect and colour our individuality and we become aware of any great change in them. Hence they may play a part in producing melancholia and hypochondriasis on the negative side or a sense of well-being on the positive side. But the threshold of consciousness is not fixed or invariable. Thus the neurotic learns to speak of his internal sensations with an intimate knowledge to which the normal man is a stranger. Visceral pains can scarcely be conveyed by special nerves, which may never be called into action throughout the life of an individual or the history of a race. It is far more probable, as Foster said, that "the constant smouldering embers of common sensibility may at any moment be fanned into the flame of pain."

Lennander believes that all the pains produced in the abdominal cavity must be referred to the parts, particularly the parietal peritoneum, innervated by the lumbar and sacral somatic nerves. But Hurst points out that this view does not sufficiently take into consideration the fact that an adequate stimulus must be applied. Tension on the muscular fibres of a hollow viscus is the stimulus which it naturally has to encounter, and this stimulus proves adequate to elicit pain. Thus the pain of a gastric ulcer is most probably due to spasm; it is certainly not due to hyperchlorhydria. The agonising pains of hepatic or renal colic, of intestinal or urethral obstruction are examples of increased tension as a cause.

The scantiness of the afferent fibres in the viscera and their defective power of localising internal sensations have an important bearing on referred pain. Head pointed out that, when a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the pain is referred to the latter rather than to the former, where, however, the stimulus actually arose. The segmental arrangement of the primitive vertebrate still persists in the skin and muscles. Bolk calls the former dermatomes, the latter myotomes, metamerism being more obvious in the dermatomes, the central portions of which correspond with the zones of hyperaesthesia which Head found on the surface of the body in the presence of visceral disease. Head explained this by saying that when abnormal excitations from a diseased internal organ reach the cord by way of its afferent nerves the excitability of its spinal segment becomes enhanced, so that when another cutaneous excitation of low intensity reaches the same segment it provokes pain, whereas under normal conditions it would only arouse a sense of contact. He was also able to demonstrate that the distribution of herpes zoster which is known to be due to an inflammation of one or more posterior root ganglia corresponds to these zones of hyperaesthesia. This fact that internal sensations have a cutaneous representation has provided us with a valuable method of localising visceral disorders as had

previously been pointed out by Ross and Sir James Mackenzie.

Time and the necessity of not encroaching on the field of subsequent lecturers prevents my doing more than indicating some of the clinical applications of our knowledge of the involuntary nervous system.

We can hardly speak of organic disease of the sympathetic nervous system, for we have practically no knowledge of its morbid anatomy. Changes have been described in pellagra, but beyond that we can only recognise such things as irritative lesions produced by pressure, and destroying lesions produced by trauma or new growth. In general, therefore, we can only speak of diseased conditions expressing themselves through the involuntary nervous system, without having any clear idea of organic change there. This is in sharp contrast with the fairly accurate knowledge we have of organic disease of the central nervous system and its somatic outflow. We can, however, clearly recognise the part played by the involuntary nervous system in many diseases, both organic and functional.

It is abundantly clear that however the sympathetic nervous system is brought into action it, at any rate, simulates the ordinary expression of certain emotions, and pre-eminently the emotion of fear—palpitations, tachycardia, sweating, blanched extremities, and gastro-intestinal disturbances. It is also clear that psycho-neurotics complain of physical symptoms of this type.

Now psychoneuroses may express themselves at any one of the three great levels of the nervous system; at the psychological level as an obsession; at the sensory-motor level as a paralysis, contracture, tic, or anaesthesia; and at the visceral level as various vegetative neuroses. The shell-shocked soldier may develop a contracture of his arm, the girl exposed to an air raid may develop Graves' disease.

That many psychoneuroses are based on a repressed or subconscious fear is now clearly recognised. Fear, whether

of evil spirits, of magic, or of the dark, panic fear dominated primitive man and, whenever our resistance is lowered by disease, by shock or by psychic conflict, we betray our ancestry. That strange primitive being which lurks in the unconscious mind of us all, peeps out.

Without in any way excluding the possibility of structural changes in the sympathetic nervous system, sometimes being responsible for manifestations of its action in disease, we are certainly justified in stating that a state of continued fear, whether recognised or not as such by the sufferer, is capable of producing the symptoms of which they so generally complain. Moreover, I believe that the great majority of such manifestations are of that order.

"Emotion moves us, hence the name," said Sherrington. It would perhaps be more accurate to say that it is designed to move us. When under conditions of modern life emotion is dissociated from the movement it should evoke under more primitive conditions, the sympathetic disturbance may continue. The mobilised army which is not allowed to fight the enemy becomes a danger to its own country. The animal that is restrained from fight or flight suffers from an increased fear.

Nervous impulses tend to run along accustomed channels as Herbert Spencer pointed out. The exciting cause may long have passed from the realm of consciousness but its effects may continue. Designed for an intensive preparation for action or defense the sympathetic response may be dissociated, perverted or prolonged. I may instance Cannon's classical experiment of the effect of suturing the phrenic nerve to the cervical sympathetic in a cat so that at every breath the thyroid gland was stimulated. The gland enlarged on that side and there was unilateral exophthalmos. Prolonged sympathetic stimulation then can enlarge the thyroid. This throws light on the emotional factor, usually a sexual one, in the aetiology of Graves' disease. This prolonged sympathetic irritation may also play a large part in digestive disturbances, for it inhibits gastric peristalsis and produces pyloric spasm.

Hence many cases of so-called "atonic dilatation" of the stomach resolve themselves on analysis to examples of sympathetic inhibition. "Better a dish of herbs where love is than a stalled ox and contention withal" is a saying which has its physiological bearing. Sympathetic irritation by stimulating the mesenteric nerves may inhibit peristalsis and cause symptoms of intestinal stasis. Some of the worst cases of this occur in women who have no employment and no object in life. The acquisition of a definite rationale for existence, whether a happy marriage, an absorbing profession or even a political agitation, may have a remarkable effect on the symptoms of visceroptosis. Again, sympathetic irritation by its vaso-constrictor action may keep the blood pressure at a level which is inappropriate for the task of the heart and the arteries.

We are beginning to work out interesting associations between the nervous and biochemical aspects of this subject, particularly in relation to blood sugar. The thyroid, adrenals and pituitary can each be brought into action through the sympathetic and they each are antagonistic to insulin, raising the level of sugar in the blood. Thus an emotional glycosuria may result, and I am fond of quoting Crile's phrase, "When stocks go down in New York diabetes goes up." On the other hand, the parasympathetic through the vagus can increase the output of enzymes in the external secretion of the pancreas, and it is possible that it can increase the output of insulin also. It has been noted that in asthma, a disease associated with an overacting vagus, the blood sugar tends to be low. That it is not invariably so in the asthmatic paroxysm might easily be due to the counteracting effect of the partial asphyxia on the blood sugar. In hunger pain the blood sugar may be low, and Graham refers that ante-prandial irritability which affects not a few to the same cause. Hector Cameron, struck with resemblance of some of the neurotic outbursts in children subject to ketoses to those seen in children with hypoglycaemia from insulin, thinks that low blood sugar may play a part in the production of neuroses in children. Although the scientific basis for

this view has been criticised there is no doubt as to the benefit derived from administration of glucose to such children. After all the craving for sugar and the detestation of fats displayed by many children may have a sound physiological basis.

I should like to put forward the thesis that in many of the diseases I have just referred to, the behaviour of the involuntary nervous system is characterized by dissociation or perseveration. This is a pathological state for a system designed to act as a whole and to act promptly.

Evolved in a subconscious plane, the sympathetic nervous system remains for ever beyond the control of the will. Timme (*Journal of Nervous and Mental Diseases*. 1914, vol. xli, p. 259) quotes an instance which, while apparently contradicting this, proved on further enquiry to support it. This was the case of a man who could voluntarily dilate his pupils, who could cause the pilo-motor muscles to raise the hairs on his arm, and who could at will produce the phenomenon of "goose-flesh" in various parts of his body. When closely questioned, he admitted that the effects were produced not immediately by his will, but always by the intermediation of some association called into being by him. Thus, when dilating his pupils he always imagined himself looking far into space, under which conditions the pupil does dilate. For the goose-flesh effect he would picture to himself his arm plunged into ice-cold water, and the goose-flesh appeared. Various associations produce autonomic effects without our will, and it is reasonable to infer that, if we can recall these associations through our will, the same autonomic effects will be produced.

"Man is not a reasonable creature; he is merely in process of becoming one," says H. G. Wells. Many of our responses are unreasoning. The art of medicine is to come to the aid of such responses by interpreting their meaning. "From the pain of the individual we learn lessons which we apply to the benefit of the community at large."

Sir James Mackenzie neatly defined symptoms as the disturbances of normal reflexes. A normal reflex is certainly purposive and should be painless. Through a chain of conditioned reflexes we associate ideas and achieve consciousness. This consciousness appreciates that a disturbance of the normal reflex is painful, and being still purposive proceeds to investigate the cause of the pain. The dog licks his bite, the burnt child dreads the fire, but from such simple defensive reflexes as these are built up elaborate associations of ideas until in the process of social evolution certain individuals become set apart to be epicritic on other people's protopathic sensations and to try and rectify these disturbed and therefore painful reflexes. There is thus no break in the chain between simple reflexes and the evolution of the medical profession. Behold us, here assembled as the last link in a long chain of conditioned reflexes!

HYSTERIA AS A PRACTICAL PROBLEM *

C. MACFIE CAMPBELL

During the past three decades the psychological mechanisms at the basis of hysteria have been studied intensively; the results of these studies have not only revealed the complexity of the underlying forces in hysterical disorders but have thrown a flood of light on psychopathology in general. The subtle psychological formulations of hysteria may leave the average physician somewhat puzzled; in face of the endless ramifications of the subconscious he may hesitate to accept the challenge of the hysterical patient. This would be unfortunate for the hysterical patient comes first of all to the attention of the general practitioner and of the various medical and surgical specialists before he is referred to the psychotherapist. The contact with the specialist has an important influence on the later history of the case, and the ability of the special-

* Delivered October 8, 1929.

ist to see the symptoms in the setting of the whole situation is of the greatest importance. The general practitioner, through his early contact with the hysterical patient, is strategically in a very favorable position; with a clear grasp of certain general principles he can often, single handed, give the patient all the help necessary for recovery; where physical symptoms are obscure and consultation necessary he can safely steer the patient between the Scylla of inadequate physical examination and the Charybdis of over-emphasis on minor anomalies elicited by highly specialized procedures; where the psychological problem requires for its solution special psychotherapeutic training and experience he can, without waste of time, refer the patient to a colleague in whose technical training and good judgment he has confidence.

What is essential for the management of the hysterical patient is not so much a profound and detailed knowledge of psychological mechanisms as the full realization of the simple fact that the hysterical symptom indicates a second-rate and evasive way of meeting the demands of life; hysteria is a problem of the conduct of life. The aim of the treatment is to enable the patient to deal with life in a more adequate way. The patient has the full responsibility for the conduct of his life; the physician has the responsibility for giving his technical help in reviewing the situation and for giving the patient some courage to discard the symptoms and to face directly the demands of life.

Hysteria is a polymorph disease; it is the great simulator. In some cases the symptoms at once indicate that it is a problem of very complex nature as in fugues, amnesia, morbid fears, delirium, and are referred to the psychiatrist or neurologist. In other cases the symptoms do not in themselves at once point to the underlying emotional and instinctive factors and are brought to the attention of the general practitioner and of the medical and surgical specialists. The hysterical symptom, whether a fugue or a paralysis, is the expression above the surface

of important underlying forces, which have been dissociated from the rest of the conscious personality but which, although repressed, continue to manifest their existence in this modified form.

The physician in studying the hysterical patient will find it helpful to keep clearly separated the problem of the genesis of the symptoms from the problem of the exploitation of the symptoms by the patient. The term exploitation must not be taken to mean the conscious and deliberate exploitation; it simply means that the symptoms are utilized unconsciously or consciously by the patient in his adaptation to the life situation. It is impossible in many cases to say whether the utilization is fully unconscious or to what degree it may be conscious, and it is never necessary to enter into a dialectic with the patient on this subject, as one can formulate the situation in terms of adaptation or adjustment without using terms which might provoke an unprofitable discussion with the patient. The physician must be on his guard, on the one hand, against being so preoccupied with the genesis of the symptoms that he neglects the problem of their utilization by the patient, and on the other hand against emphasizing so much the utilization of the symptoms that he fails to pay enough attention to the symptoms on their own merit. In dealing with the patient the physician has constantly in mind as his goal the health of the patient and not simply the health of any special system nor the removal of a particular symptom. The health of the patient means a healthy balance between the complicated tendencies of his nature, and a healthy output of energy in reaction to the demands of the cultural environment. The patient should, from the very first, get from the physician this point of view. He should from the beginning realize that the total situation of his disability is under scrutiny and that medicine is interested in the patient and not merely in the disease or in the symptom. There will at no time be the necessity of any futile discussion as to what is mental and what is physical. The patient will see that the basal functions of the individual organs are reviewed, that their relation-

ship to emotional patterns is considered, that the complexity of the emotional and instinctive life and the demands of the life situation are also brought into the equation. In order that the physician may be able to interpret the symptoms on a broad enough background he must have an adequate insight into human nature, must be familiar with the instinctive and emotional life, must know something of man's evolution and of the various stages in individual development. He must be sensitive to the special significance of the actual environment, must evaluate situations which tend to elicit fear, depression, anger, love, self-depreciation, or which stimulate the imagination or reactivate primitive beliefs. He must be sensitive not only to the presence of disturbing factors but also to the absence of sources of cultural satisfaction, without which the patient may reach out for any available substitutes. The physician may not give his patient any lecture on these topics but his knowledge of man's endowment and of his evolution will enable him to place the symptom of the patient in a setting much broader than that which has hitherto been available to the patient.

In face of the somatic complaints of his hysterical patient the first problem of the physician is to make a diagnosis. Are the subjective complaints and the disabilities of the patient adequately explained on the basis of some repressed trend and do they owe their persistence to the rôle which they play in the adaptation of the individual to life? The diagnosis of hysteria is not merely a negative diagnosis, the demonstration that there is no adequate somatic basis for the syndrome; it is also a positive diagnosis, a demonstration that the symptoms are a component part of an adaptation to the demands of the environment.

The physical symptoms in the hysterical patient may arise in a great variety of ways. The symptoms may be due to an unimportant idiosyncrasy or to some constitutional weakness of the patient. Some individuals in response to excitement, no matter of what origin, are liable

to vomit or to feel faint or to have diarrhoea. This facile development of a symptom like vomiting may be practically neglected by the patient; on the other hand, it may be emphasized by him and utilized in order to obtain privileges and to escape duties. On the basis of such an idiosyncrasy a school child with a solicitous mother may dominate the situation, arrange his diet to suit his whims, be quite irregular in attendance at school. Where there is a more special constitutional weakness like a tendency to megrim headache it is an extremely difficult matter to determine to what extent the individual attacks are due altogether to impersonal factors and how far they are due to emotional tension associated with internal conflicts which may be open to modification. The migrainous daughter of a migrainous mother seemed entitled to her headaches, but a review of the situation showed that the headaches occurred in the setting of a clandestine love affair which did not seem to be irrelevant to the occurrence of the attacks. In a woman subject to asthma since early childhood the asthmatic condition was very much worse during a period when her life was complicated by a love affair, while a review of the whole situation seemed to contribute definitely to the reduction of the attacks. In some cases the physical symptom is placed at the disposal of the patient owing to some incidental disturbance. Soldiers exposed to mustard gas were liable to suffer from vomiting probably due to gastritis; in some cases the vomiting persisted and this appeared to be due to the underlying craving for freedom from danger and shelter in hospital. The persistent vomiting of pregnancy in some cases is probably due to the same utilization of a symptom which, at its beginning, is a purely physiological reaction.

In other cases the somatic factors are not due to an impersonal physiological idiosyncrasy or to an independent disorder, but are components of an emotional reaction. Paralysis may be due to fear, vomiting may be caused by a disgusting experience, a choreiform condition or convulsive episodes may be the residual from some erotic

experience or be the expression of disturbing erotic tension. The rôle of phantasy has to be considered also and a symptom may express the unconscious identification of the patient with some person of great emotional significance for the patient.

In many cases the physical symptoms are the expression of tendencies closely related to the sex instinct, deeply rooted in the constitution or the early experiences of the individual and in some cases requiring much time and painstaking analysis for their full elucidation. Detailed presentation of such cases is to be found in the psycho-analytic literature.

In many cases of hysteria the diagnosis is comparatively easy—a paralysis with no characteristic alteration of the reflexes and with inappropriate sensory disturbances, convulsive attacks that are dramatic and which fit in with no organic formula, a sudden and unexplained blindness, aphonia with no somatic explanation, vomiting which is not due to any neurological or visceral disorder, fugues which cannot be attributed to epilepsy, amnesia which corresponds to no type of organic psychosis. It may also be a simple matter in many of these cases to trace the symptom to its precipitating situation and to see the aphonia as the result of an unspeakable experience, the fugue as the satisfaction of some underlying craving, the convulsive attack as the reliving of experiences distressing but fascinating, the paralysis as the atonement for or the elimination of an activity condemned by the patient. Even in those cases where the symptom is rapidly conjured away it is well for the patient to be helped by the physician to realize the rôle of the personality in the genesis and utilization of the symptom, and to plan for a more robust mode of life.

The interpretation of the symptoms is not always so easy as in the transparent cases referred to above. In other cases the symptoms develop insidiously, there seems to be more justification for them on a somatic basis, the utilization of the symptoms is not so apparent. With sub-

jective complaints such as weakness, fatigue, dizziness, headache, and objective evidence of some gastro-intestinal, gynaecological, cardiovascular or other disorder, the patient seems entitled to the rôle of victim of some impersonal disease process.

A middle-aged woman for years had complained of trouble with her eyes, of discomfort in her head; episodes of dizziness were frequent, she had morbid fears. An early ophthalmological report referred to "a variable heterophoria, concentric contraction of the field of vision with hyperemia of the optic discs which suggested neurasthenia." The external ocular muscles had been operated on, glasses were prescribed. In addition there had been a minor gynaecological operation.

The physician may feel in such a case that he is not competent to appraise at its just value the ophthalmological interpretation but, while he feels some diffidence on this score, he may yet realize that the total picture is too complicated to be put altogether at the door of the eye condition. He need not become involved in any detailed discussion of the eye symptoms with the patient but, having reviewed them, he may emphasize to the patient the equal necessity of considering other factors in the total situation. He may suggest to the patient that, even making allowances for some difficulties caused by the eye condition, the total handicap may be to a large part determined by more complex factors, by the memory of past experiences, by repressed instinctive desires, by complicated emotional undercurrents. The patient thus invited to review the total situation may gladly accept it. Charles Darwin wrote of Dr. Robert Darwin, his father, "Owing to my father's power of winning confidence many patients, especially ladies, consulted him when suffering from any misery, as a sort of Father-Confessor. He told me that they always began by complaining in a vague manner about their health and by practice he soon guessed what was really the matter. He then suggested that they had been suffering in their minds and now they would pour

out their troubles, and he heard nothing more about the body." It is not always so easy for the patient to pour out troubles; outpouring is more hard for some than for others; some troubles are more hard to pour out than others; the underlying trouble may have been repressed and dissociated from consciousness in such a way that it comes to expression only after repeated interviews. Nor is the outpouring unattended with risk. The frank outpouring of what has been dammed back may reveal a bitterness and resentment which the patient has never consciously realized. There may be great relief from such a frank release of emotion; it may be possible for the patient to digest and assimilate the released factors in the light of frank discussion with the physician. On the other hand it may be difficult to get back the contents into a tightly packed container, and underlying attitudes once rendered explicit may dominate consciousness to an unpleasant degree. The physician may have to consider whether a hysterical invalidism may not be the best compromise available in the individual case in view of the duration of the habits formed by the patient, the limitations of the resources in the personality and the rigidity of the life situation confronting the patient. In the twenties, no matter how difficult the situation, romance and happiness may still seem possible; in the forties the possibility of romance may have departed and the patient may not be able to digest the bitterness of the loss. The physician, therefore, must not take it for granted that, if he merely makes a sufficiently searching examination and come to understand completely the genesis of the symptoms, the symptoms will be immediately discarded and that the patient will take up the conduct of life in a more robust way. Unable to face the actual facts with a philosophy which makes life tolerable, the patient may indulge in a bitter and ironical dialectic with the physician: "I am told I have had the wrong attitude. . . I have not the most remote idea what you want me to do. . . in my stupid misunderstanding of your advice I am losing time. . . I will not allow my brain to be befogged by a lot

of words that mean nothing to me and persuade myself, under the stimulus of your dominating will, that my wretchedness no longer exists." Such an attitude, in a mild form, is a familiar phase in the treatment of many cases but in some it is the final attitude of the patient towards the crucial choice between facing reality and continuing to lean on the crutch of invalid symptoms.

A man of considerable education gave up his career on the basis of eye symptoms not dissimilar to those of the preceding case. The eye condition had been minimized by one ophthalmologist but taken seriously by another. Spoiled as a child, he had never faced the responsibilities of life in an honest and mature way, and when encouraged to review the real problems of his life he presented a smooth but resistant surface and merely reiterated the details of his ophthalmological history. The indolent and self-indulgent habits of a life time, fostered by his early training, rendered futile the efforts of the physician. It is possible that in such a case one physician may succeed where another will fail. With a patient of this type with so little spontaneous tendency to grapple with his problems one may have to allow much time before a new point of view is even partly accepted. One may have to withdraw him from the enervating atmosphere of a sympathetic family. One may require some ingenuity in tempting him to resume gradually a career adequate to his endowment and to stimulate his latent altruism by contact with more strenuous minds, if not in person perhaps through literature.

The physician, in face of the reports of specialists upon organic disabilities and of a history of disability going back many years, may hesitate to embark on a therapeutic adventure, and yet may find that the discussion of the personal aspect of the disorder with the patient leads to gratifying improvement.

A middle-aged woman with genito-urinary symptoms had been examined by many specialists and claimed that

her only help could come from drugs or surgery. She explicitly said that she preferred surgery to discussing personal matters. Notwithstanding this it was possible to get the patient to review her life in a somewhat timid way, to see the importance of factors which she had tried to ignore, and to realize that she had a certain responsibility in regard to the way in which she utilized the symptoms which she claimed had existed from childhood. Her previous attitude had thrown responsibility on the surgeons and physicians; the ureters had been dilated, the appendix (not pathological) had been removed, heart symptoms had been treated for three months by a placebo. The utilization of the symptoms was brought to the attention of the patient; she came to realize that a complaint of genital pain was, to a large extent, the expression of erotic tension; the direction of the patient's interest to a practical program within her capacity led to a resumption of social activity and modest usefulness.

In this case the patient emphasized continuously the severe genital pain as others emphasize symptoms such as headache and insomnia. In such cases the severity of the so-called pain is not easy to estimate and where no measure is possible it is as well to avoid discussion. The patient may tend to lead the physician on to this debatable ground and get some satisfaction out of arguments as to the exact hours of sleep or the exact severity of headache.

A middle-aged woman complained of the most severe recurrent pain in the head, but nothing in her expression or behaviour during the period gave evidence of incapacitating pain. In view of these pains in the head and of other somatic pains there had been the usual medical pilgrimage and procedures of examination and tentative diagnoses. Gland therapy had been tried, a sinus operation had been recommended, the greatest variety of drugs had been employed. The patient seemed to derive considerable benefit from a thorough review of the situation and from facing the possibility that she had a cer-

tain responsibility in the premises, that the general program of her life was unjustifiably restricted and that the amount of interest concentrated upon her in the setting of her medical treatment perhaps made a subtle appeal to her. In this case the concentration of the interest of those around her upon her symptoms had probably done much to stereotype her complaints and lead her to increase her emphasis on them.

As to the procedure adopted by the physician in face of the individual patient, there is no uniformity. Some physicians take up the investigation of the factors in the individual case in whatever way seems most appropriate and without any strict rule of procedure. Other physicians have a secret hankering after the mystical quality inherent in a special technique and adopt a uniform procedure, with modifications to suit the individual case. The question as to the value of the hypnotic procedure arises from time to time. Some physicians have found it useful for the investigation of the facts in the case; others use it to reenforce their therapeutic suggestions. One can understand the appeal which the procedure may make both to the priest-magician within the modern physician and to the primitive within his twentieth century patient, and modification of symptoms may perhaps in some cases be more rapidly attained in this way; where the symptoms have been more or less incidental and not deeply rooted, treatment of this kind may be adequate. There is, however, in the hypnotic procedure a certain element of the dramatic which is undesirable and as a rule unnecessary. What is dramatically revealed in the hypnotic setting may better be revealed in the setting of a frank conversation without the subtle appeal to the primitive and mystical. The dramatic disappearance of an amnesia in the hypnotic setting can be duplicated in the setting of a frank conversation, where the patient may be enabled within a brief period so to change his attitude, that memories previously not available are allowed to come into consciousness with a frank disclosure by the patient of the whole emotional

experience, which is at the basis of the amnesia. What a patient reveals in the hypnotic setting has still to be assimilated by him in the ordinary workaday attitude. It is probably more wholesome for him not to be encouraged to give up this workaday attitude even in the consulting room. As far as the patient is concerned the hypnotic admissions and abandonment of the symptoms still leave a loophole for retreat if necessary; in the waking state they still have to be accepted and consolidated. So a hysterical girl in a semi-delirious episode revealed the source of all her conflicts to the nurse, but in interviews with the physician blandly denied knowledge of all disturbing factors. In brief, what can be done under the hypnotic technique can probably be equally well done without it, merely in the setting of a frank conversation. The latter is the better and more direct procedure.

The physician, anxious for a special technique of investigation, may adopt the psychoanalytic technique upon which so much emphasis has been laid of recent years. According to his temperament and personal associations he may adopt one or other of the different procedures. Some physicians lay a great deal of emphasis on what may be considered almost a ritual of procedure and upon rigid dogmas of explanation which take the part of a creed, and in a ritual of this type there will be the same subtle appeal to the mystical as in the hypnotic procedure. The therapeutic gain of the patient is often attributed to the special procedure and to the special psychological formulations with which he has become imbued, but one cannot underestimate the therapeutic value of the personal relationship with the physician, of the mental habits and attitudes fostered by this type of personal review, of the relief due to the complete revelation of underlying forces which can now be seen on the background of human biology adequately conceived.

The patient who has been honestly reviewing the forces at the basis of his personal difficulty during a series of interviews is naturally much influenced by the doctrines

of the physician who is treating him, and may feel that his improvement is specially related to the definite doctrines of that physician. Different physicians, however, may give a very different interpretation to the same material, although they claim equally good therapeutic results. The benefit to the patient seems to depend very little upon whether the physician attributes a morbid fear to the conversion of repressed libido or to the reactivation of an old and real fear of threatened castration or to the devastating experience of being born.

One of the practical problems which presents itself in regard to the hysterical patient is that of the duration of the treatment. With regard to this no general formula can be given. A great variety of considerations enter into the question quite apart from such practical considerations as the time and money available. In many cases the symptoms rapidly disappear and the personality is sufficiently robust and the situation sufficiently favorable so that after one or two interviews no further treatment is required. In children hysterical conditions are very often simply disposed of if the coöperation of the parents is obtained. In some cases, though the symptoms seem simple, they may have complicated roots which reach far down into the instinctive life and far back into the childhood of the individual. It may take a long time before the full significance of the symptoms is appreciated but the end of the treatment and disappearance of the symptoms may coincide with the unravelling of the complex psychological problem. In other cases it is not the complicated genesis of the symptoms which makes the treatment prolonged but rather the degree to which the symptoms have been woven into the life program so that they are given up with difficulty. Occasionally the situation of the patient is so rigid and imposes a strain of such a nature that the symptoms are found to be too valuable a weapon of offense or defense to be surrendered, and if the situation is not open to modification the treatment may be discontinued even though the symptoms persist. Some

patients continue indefinitely discussing intimate psychological details while they claim to be unable to resume normal productive life and feel that constructive activity should be postponed until they have completed their psychological investigations. Thus one patient, who had for many years been treated by a variety of psychotherapists, was clinging to a statement attributed to one of her physicians that she would not be able to resume work until she had regained the memories of certain experiences which had happened at a very tender age. She was apparently quite reconciled to spending the rest of her life in pursuit of these memories.

In those cases where the symptoms are in part determined by the absence from the individual's life of healthy interests and cultural outlets and social activities an important part of the treatment consists in attending to this constructive aspect of the patient's life. It may not be enough to show how the symptoms arose or why they continued. It may also be necessary to help the patient to outline a well balanced program, to call to the patient's attention opportunities for cultural stimulus and inspiration, to encourage the patient to take the first steps in certain occupational or recreational or social activities which from disuse have become difficult for the patient. A patient may recover owing to the introduction of a new interest in life, a new enthusiasm, as well as from increase in psychological insight. It is gratifying, however, to know that the patient has such insight and is therefore less vulnerable and not too dependent on variations in satisfaction from the external environment over which he may have little control.

A patient may wish to continue treatment even when the symptoms have disappeared because of a desire to overhaul thoroughly the machinery upon which the later efficiency and value of his life will depend. Some patients, as soon as they have obtained a certain insight into the mechanisms of their disorder, are impelled by missionary zeal to discontinue treatment in order that they may help

some of their nervous acquaintances; perhaps with a more complete insight they would have sufficient satisfaction in their normal vocations and avocations to make the rôle of missionary unnecessary.

The physician, in face of a hysterical condition, may go beyond the personal contact with the patient and may take steps to modify the environment of the patient. In the treatment of the hysterical child he may lay the main emphasis on attention to an over-solicitous parent. He may feel it desirable to modify the attitude of parent or husband or wife of the hysterical patient in order that an attitude of undue severity or of undue laxity or lack of mutual understanding may be modified. The physician may not wish to undertake too much responsibility with regard to the regulation of the patient's life or with regard to the modification of the life situation, but he cannot fail to scrutinize the total situation and to consider what, with discretion, might be done to modify it.

In the treatment of the patient many problems come up for discussion and the patient may consult the physician with regard to decisions with regard to career, with regard to choice of occupation, with regard to marriage or divorce, with regard to general and special questions of ethics and a philosophy of life. The physician has a special responsibility for advising with regard to questions of health; as to the personal values of his patients he may professionally have no concern. He has to treat patients whose ethical standards and outlook on life may differ widely from his own. In medicine in general there is at the present a tendency to complain that the attitude of the physician is too impersonal, that the patient is neglected while his various systems and organs are studied with admirable care. So in regard to the hysterical patient, one might attempt to study the psychological system in an absolutely impersonal way while avoiding any influence upon the patient which would tend to mould his philosophy of life or modify his doctrine of values. It may appear to some that the responsibility for his scheme

of values depends absolutely upon the patient and that the physician should not complicate the patient's problem by introducing his personal point of view. The psycho-analytic insistence on the physician himself undergoing a careful process of self-analysis so that he is conscious of the sources from which many of his values are derived is very sound in principle. In the treatment of the hysterical patient, however, we have to consider more than an intellectual psychological problem. If life is not worth living when measured by the ordinary coarse measures of success the individual of a certain temperament may easily lapse into hysterical evasions which bring in a subtle gain. Life has to be made worth living to the hysterical patient and the physician may perform a useful therapeutic work in helping the patient to see life not in a dreary and drab way but as full of possibilities which touch a responsive chord in the patient and mobilize reserves of energy. The physician may have a personal philosophy of life which his hysterical patient may be able to utilize; if not the physician may help the patient to build up his own philosophy of life and put him in touch with valuable sources of stimulation and inspiration in literature.

The physician may be at a loss when faced with the individual sex problems of his patient and with a code which he may not personally approve. A tolerant and sympathetic attitude helps the patient in his self-analysis, but a detached or indifferent attitude towards questions of human value may fail to give the patient essential help. The self-analysis of the patient, the detached biological attitude of the physician, may require to be supplemented by those spiritual vitamins which make life full of meaning and which are essential to full mental health. These factors are implicit in that wisdom which Maeterlinck sees as the escape from the bondage of our blind instincts: "As we become wiser we escape some of our instinctive destinies. There is in us all sufficient desire for wisdom to transform into consciousness most of the hazards of life. And all that has thus been transformed can belong no more to the hostile powers."

To sum up the general trend of this paper: The physician in face of a hysterical condition must take adequate steps to see that all the simple somatic functions are carefully reviewed and their part in the disability given due weight. In this procedure he must avoid any danger of the somatic or impersonal factor being over-emphasized. When convinced that the disability is in part dependent on underlying and dissociated factors such as repressed desires and memories he can put frankly before the patient his general interpretation of the condition and encourage the patient to adopt such an attitude towards his personal problems and situation that the repression is overcome and the patient sees that the problem is one not of impersonal disease but of the conduct of life. When a physician takes up seriously this problem of helping the patient towards a franker realization of the real problems of his or her life, he may give the patient the help necessary even without the aid of any complicated psychological technique or elaborate system of interpretation.

A MAGNIFICENT GIFT OF A COLLECTION ON FOODS AND COOKERY

Dr. Margaret Barclay Wilson, Professor of Physiology and Hygiene at Hunter College, has just made a very generous gift to the Academy. It was Dr. Wilson's intention that this should be done through her will, but we believe that Dr. Frederick S. Dennis and Dr. Harry P. Swift, both Fellows of the Academy, induced her to make the gift now. She is a well recognized authority on diets, foods and cookery, and during the European War her knowledge was of great value in solving the problems of feeding civilian as well as military forces engaged in the struggle. For a considerable number of years, but especially since 1919, she has gathered together the important texts in twenty different tongues on foods, cookery, gastronomy and allied subjects, as well as herbals. It is this collection of about four thousand volumes and a like number of pamphlets, clippings, etc., which Dr. Wilson has now presented to the Academy. The bibliographical gourmet will find in this library the choicest and richest morsels to tickle his mental palate and at the same time a properly balanced meal with abundance of mental aliment. Surely its size alone would satiate the bibliographical glutton, for it is one of the largest, if not the largest, in the world.

The most important single item is, undoubtedly, a ninth century manuscript of fifty-eight leaves, in Latin, of the work of Caelius, which he called "Apicius," and is known as "De Re Coquinaria," "De Re Culinaria," etc. It is a collection of receipts made in the third century A.D. founded on Greek originals. Caelius entitled it "Apicius" because there were three famous Roman epicures of that name. As has been the case elsewhere, the author's name has been confused with the title of his work and we hear him referred to as Caelius Apicius. On the other hand, in the *Gesamtkatalog der Wiegendrucke* it is stated that probably the author was M. Gavius Apicius of the time of Tiberius, but certainly not Apicius Caelius ("Wohl M. Gavius Apicius, z. Z. des Tiberius, sicher nicht Apicius

Caelius"). The manuscript was No. 275 in the famous Phillipps' collection of manuscripts at Cheltenham. Imagine a book on cookery eleven centuries old! It is now indeed, one of the Academy's most precious possessions, and pious pilgrimages will be made to see it. The only other known manuscript of Apicius of like importance and age is that in the Vatican (Vaticanus Urbinas lat: 1146). It is not certain which of the two manuscripts is the older.

This famous work on cooking is also represented in Dr. Wilson's collection by almost all—possibly by all—its editions, namely: the two incunabula, Venice, undated, and Milan, 1498; Venice, 1503; Basel, 1541; Lyons, 1541; Zurich, 1542; London, 1705, and Amsterdam, 1709, both with notes by Martin Lister; Marktbreit, 1787; Venice, 1852; Heidelberg, 1867; Leipzig, 1922; as well as several translations in Italian and German. An English translation by Dr. Wilson herself will be published in the near future.

The books are arriving in lots at the Academy every few weeks but it will be some time before they are all here and longer still before they are completely catalogued. We propose to arrange an exhibition of some of the choicest items later on.

We should, and do, feel complimented that Dr. Wilson has chosen the Academy as a repository for her collection. Through visits to consult her library the public, lay as well as medical, will learn what the Academy and its medical library are doing and hope to do. In greater numbers *chefs de cuisine* will now mingle with *chefs de clinique* in the library and we can foresee important consultations between the two over the merits of various recipes.

No longer need the doctors be reproached about their ignorance in prescribing meals for their patients. Listen to some of the categories into which the books of this new acquisition fall: Fasting; Diabetes; Convalescents', Invalids', Infants', Hospital, and Fattening Foods; Food for the Aged; Nutritive Values; Gout; Obesity, Grape and

Whey Cures; Remineralization; Liquid, Meat, and Meatless Diets; Herbs; Vegetarianism; Gluttony and its *vis-à-vis* Fasting. Doctors who are surgically minded will find some excellent Italian works on carving, the chiefest amongst which is *Il Trinciante* by M. Vincenzo Cervio, Venice, 1593.

In addition, Dr. Wilson has presented a valuable set of old surgical instruments from Pompeii.

ARCHIBALD MALLOCH.

A FELLOWS' SPECIAL FUND

Once again some Fellows of the Academy have put their hands in their pockets and purchased three important books for the Academy. We already had three editions of *De proprietatibus rerum* of Bartholomaeus Anglicus who flourished about the middle of the fourteenth century, namely: Nuremberg, 1483; Strassburg, 1485; and Lyons, 1500. Now we also possess a beautiful fifteenth century manuscript of the same work in Latin, executed in Italy.

With this "Fellows' Special Fund" we obtained an early incunabulum of medico-psychico-theological interest, in fact it is one of the earliest incunabula of any medical interest, and it is certainly our earliest printed book. It is entitled *De pollutione nocturna tractatulus* by Johannes Gerson (1363-1429), and was printed at Cologne by Ulrich Zell about 1470. Jean Charlier de Gerson was Chancellor of the University of Paris and one of the most distinguished Frenchmen and Churchmen of the fifteenth century. The third book purchased was the *Regiment der Jungen Kinder* of Bartholomaeus Metlinger (died 1492), Augsburg, printed by Johann Schaur, 1497; we already had an earlier edition (Augsburg, printed by Johannes Bämmler, 1474) of this book, one of the earliest on pediatrics. Our new acquisition is particularly interesting and valuable on account of the woodcut of a German interior in the

fourteenth century showing an infant in a cradle and another child looking at a book. It is an important bibliographical point that the same woodcut together with the title is also on the verso of the title-leaf. This edition is very rare as copies are listed for Nuremberg and Stuttgart only.

ARCHIBALD MALLOCH.

RECENT ACCESSIONS TO THE LIBRARY

- Bailey, F. R. & Miller, A. M. Text book of embryology. 5. ed.
N. Y., Wood, 1929, 687 p.
- Bashford, H. W. The Harley Street calendar.
London, Constable, 1929, 272 p.
- Berger, H. I. Blood, chemical and laboratory diagnosis.
St. Louis, Battle, 1929, 162 p.
- Boas, E. P. & Michelson, N. The challenge of chronic diseases.
N. Y., Macmillan, 1929, 197 p.
- Brock, A. J. Greek medicine.
London, Dent, [1929], 256 p.
- Chasman, C. Manual of mechanical dentistry.
N. Y., N. Y. School of mechanical dentistry, [1929], 182 p.
- Clark, A. H. Organic chemistry.
N. Y., Van Nostrand, 1929, 446 p.
- Clendening, L. Modern methods of treatment. 3. ed.
St. Louis, Mosby, 1929, 815 p.
- Clough, P. W. Diseases of the blood.
N. Y., Harper, 1929, 310 p.
- Crumbine, S. J. & Tobey, J. A. The most nearly perfect food. The story of milk.
Balt., Williams, 1929, 292 p.
- Dakin, E. F. Mrs. Eddy.
N. Y., Scribner, 1929, 553 p.
- Davenport, C. B. & Steggerda, M. Race crossing in Jamaica.
Washington, Carnegie Institution, 1929, 516 p.
- Davis, D. M. Urological nursing.
Phil., Saunders, 1929, 300 p.
- Dawson, W. R. Magician and leech.
London, Methuen, [1929], 159 p.
- Diamond, M. Dental anatomy.
N. Y., Macmillan, 1929, 300 p.
- East, C. F. T. & Bain, C. W. C. Recent advances in cardiology.
Phil., Blakiston, 1929, 342 p.

- Eberts, E. M. Surgical diseases of the thyroid gland.
Phil., Lea, 1929, 238 p.
- Eyster, J. A. E. The clinical aspects of venous pressure.
N. Y., Macmillan, 1929, 135 p.
- Farez, P. Causeries sur l'art de bien gérer sa santé.
Paris, L'Expansion scientifique française, 1928, 362 p.
- Farr, R. E. Practical local anesthesia and its surgical technique. 2. ed.
Phil., Lea, 1929, 611 p.
- Foote, J. A. State board questions and answers for nurses. 7. ed.
Phil., Lippincott, [1929], 582 p.
- Frank, R. T. The female sex hormone.
Springfield, Ill., Thomas, 1929, 321 p.
- Fraser-Harris, D. F. The rhythms of life.
London, Routledge, 1929, 185 p.
- Fulkerson, L. L. Gynecology.
Phil., Blakiston, [1929], 842 p.
- Further studies upon chronic epidemic encephalitis. Edited by August Wimmer.
Copenhagen, Levin, 1929, 174 p.
- Gillespie, R. D. Sleep, and the treatment of its disorders.
London, Baillière, 1929, 267 p.
- Goepp, R. M. Nurses' state board questions and answers. 2. ed.
Phil., Saunders, 1929, 541 p.
- Gonzalez Urueña, J. Le traitement des teignes par l'acétate de thallium.
Paris, Masson, 1928, 144 p.
- Harrower, H. R. Endocrine diagnostic charts. 2. ed.
Glendale, Cal., Harrower Laboratory, 1929, 144 p.
- Henrick, A. T. Morphologic variations and the rate of growth of bacteria.
London, Baillière, 1928, 195 p.
- Interns Handbook.
Phil., Lippincott, [1929], 254 p.
- Koch, W. F. Cancer and its allied diseases.
Detroit, Author, 229 p.
- Krogh, A. The anatomy and physiology of capillaries. Rev. ed.
New Haven, Yale Univ. Pr., 1929, 422 p.
- Lambert, S. L. & Goodwin, G. M. Medical leaders from Hippocrates to Osler.
Indianapolis, Bobbs-Merrill, [1929], 330 p.
- Larkin, A. J. Radium in general practice.
N. Y., Hoeber, 1929, 304 p.
- Léo, Helminthes et protozoaires; les plus fréquents.
Paris, L'Expansion scientifique française, 1929, 214 p.
- Lutembacher, R. Etude élémentaire des arythmies.
Paris, Masson, 1929, 110 p.
- MacAusland, W. R. & MacAusland, A. R. The mobilization of ankylosed joints by arthroplasty.
Phil., Lea, 1929, 252 p.

- Malmy, M. *Méthode pratique de diagnose des médicaments chimiques*.
2. ed.
Paris, Le François, [1929], 121 p.
- Marçais, A. *Homéopathie complexe*. 4. ed.
Paris, Vigot, 1929, 302 p.
- Memmesheimer, A. M. *Die Technik und Anwendung der Suboccipital-
oder Zisternenpunktion*.
Zurich, Konegen, [1929], 80 p.
- Orban, B. *Dental histology, and embryology*. 2. ed.
Phil., Blakiston, [1929], 218 p.
- Orr, H. W. *Osteomyelitis and compound fractures*.
St. Louis, Mosby, 1929, 208 p.
- Park, W. H., Williams, A. W., and Krumwiede, C. *Pathogenic
microörganisms*. 9. ed.
Phil., Lea, [1929], 819 p.
- Patten, B. M. *The early embryology of the chick*. 3. ed.
Phil., Blakiston, [1929], 228 p.
- Pfeiffer, H. *Elektrizität und Eiweisse*.
Dresden, Steinkopff, 1929, 149 p.
- Przibram, H. *Einleitung in die physiologische Zoologie*.
Leipzig, Deuticke, 1928, 182 p.
- Rancoule, L. G. *L'aliment-vivant "vibratoire"*.
Paris, Marchand, 1928, 192 p.
- Reeves, M. *Training schools for delinquent girls*.
N. Y., Russell Sage Found., 1929, 455 p.
- Riddell, G. A. (1st baron). *Medico-legal problems*.
London, Lewis, 1929, 100 p.
- Sadler, W. S. *The mind at mischief*.
N. Y., Funk, 1929, 400 p.
- Savage, W. G. *The prevention of human tuberculosis of bovine origin*.
London, Macmillan, 1929, 195 p.
- Schilling, V. *The blood picture and its clinical significance*. 7 & 8 ed.
St. Louis, Mosby, 1929, 408 p.
- Schmucker, S. C. *Heredity and parenthood*.
N. Y., Macmillan, 1929, 322 p.
- Scholz, A. P. *Defective sight and how to cure it*.
Brooklyn, Author, [1929], 237 p.
- Schwab, S. I. & Veeder, B. S. *The adolescent*.
N. Y., Appleton, 1929, 365 p.
- Sears, V. H. *Full denture procedure*.
N. Y., Macmillan, 1929, 135 p.
- Springer, B. *Die Blutmischung als Grundgesetz des Lebens*.
Berlin, Verlag der Neuen Generation, [1929], 547 p.
- Stuckert, G. V. *Contribución al estudio de los factores físico-químicos de
la osteo y odontogenesis*.
Cordoba (Arg.), Imprenta de la Universidad, 1929, 162 p.

1080 BULLETIN of the NEW YORK ACADEMY of MEDICINE

- Terman, L. M. & Almack, J. C. The hygiene of the school child. Rev. ed.
Boston, Houghton, [1929], 505 p.
- Tindal, D. Gleanings from general practice.
N. Y., Wood, 1929, 209 p.
- Tournay, R. Les varices. Pratique des injections sclérosantes.
Paris, Maloine, 1929, 264 p.
- Wells, W. A. The common head cold and its complications.
N. Y., Macmillan, 1929, 225 p.
- Westermarck, E. Marriage.
N. Y., Cape, [1929?] 115 p.
- Wilcox, R. W. Materia medica and therapeutics. 12. ed.
Phil., Blakiston, [1929], 690 p.
- Wiley, H. W. The history of a crime against the food law.
Washington, Author, [1929], 413 p.
- Yerkes, R. M. & Yerkes, (Mrs.) A. (W.). The great apes.
New Haven, Yale Univ. Pr., 1929, 652 p.
- Zabriskie, L. Nurses handbook of obstetrics.
Phil., Lippincott, [1929], 535 p.

PROCEEDINGS OF ACADEMY MEETINGS

NOVEMBER

STATED MEETINGS

Thursday Evening, November 7

ORDER

- I. EXECUTIVE SESSION at 8:30 o'clock
 - a. Report of the Nominating Committee
Nominations for one Vice-President for three years; for Treasurer for three years; for two Trustees for five years; one member of the Committee on Admission for three years, one for one year; and one member of the Library Committee for five years
 - b. Amendments to the Constitution and By-laws to be proposed
 - c. Election of Fellows
- II. THE ANNIVERSARY DISCOURSE at 8:45 o'clock
"The infinitely small in biology and medicine," Simon Flexner, The Director of The Rockefeller Institute for Medical Research

Thursday Evening, November 21, at 8:30 o'clock

THE SECOND HARVEY LECTURE

"The minute output of the heart in health and disease"

E. K. MARSHALL

Professor of Physiology, Johns Hopkins Medical School, Baltimore, Maryland

G. Canby Robinson

Dayton J. Edwards

President

Secretary

Harvey Society

Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for November

SECTION OF SURGERY

Friday Evening, November 1, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Bilateral precancerous duct changes of breasts, Leon Ginzburg (by invitation)
 - b. An unusual case of carcinoma of breast following trauma, Frank Meleney
 - c. 1. Papillary cyst adenoma of breast
2. Chronic mastitis developing into carcinoma after four years, Frank Adair
- III. PAPER OF THE EVENING
The pathology and clinical interpretation of precancerous lesions of the breast, Max Cutler
- IV. GENERAL DISCUSSION

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Wednesday Evening, November 6, at 7:45 o'clock
(Please note change of date)

ORDER

- I. PRESENTATION OF PATIENTS
Cases from the Vanderbilt Clinic
- II. MISCELLANEOUS CASES
- III. DISCUSSION OF CASES
- IV. EXECUTIVE SESSION

NOTE: Examination of cases is limited to members and their invited guests

SECTION OF OTOTOLOGY

Friday Evening, November 8, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF NEW INSTRUMENTS OR SPECIMENS
- III. CASE REPORTS
 - a. An unusual case of mastoiditis, Harry Neivert (by invitation)
 - b. Mastoiditis complicated by pregnancy and lateral sinus thrombosis: operation and recovery, Lee R. Pierce
 - c. Bilateral purulent otitis media with argyrol allergy, Robert C. Howard. Discussion, Lawrence K. McCafferty
- IV. PAPER OF THE EVENING
Contribution to the etiology of progressive deafness, M. Gottlieb
Discussion opened by J. Marcus (by invitation), Samuel J. Kopetzky
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Joint meeting with

THE NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, November 12, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. A comparative study of the lobules of the mammalian cerebellum,
Henry Alsop Riley
Discussion, Frederick Tilney
 - b. The cerebellum: The method of stimulation, and the influence of the localized reactions in determining the course of disputed fissures, the grouping of the lobes, and the exact homology that exists between the lobes and fissures of the cerebellum of the cat, monkey and man, Aubrey T. Mussen, Baltimore (by invitation)
Discussion, Frederick Tilney, Joshua Rosett

- c. Remarks about certain phases of the cerebellar problem, Theodore H. Weisenburg, Philadelphia (by invitation)
Discussion, Frederick Tilney

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, November 13, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Surgery at the New York Hospital 100 years ago. (Lantern illustrations), Eugene H. Pool
- b. Present day medicine in India. (Lantern illustrations), Sir William Wanless, Glendale, Calif. (by invitation)
- c. Discussion of previous paper, Edward H. Hume, R. H. H. Goheen, Princeton, N. J. (by invitation), C. E. Vail, Newark, N. J. (by invitation)
- d. Recent events and publications of importance to this Section, C. N. B. Camac

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, November 14, at 8:30 o'clock

ORDER

I. PRESENTATION OF CASES

Epidermolysis bullosa, Howard Craig

II. PAPER OF THE EVENING

The bone lesions of congenital syphilis—the correlation of the x-ray and pathologic finding, Stafford McLean

Discussion, Ralph S. Bromer, Philadelphia (by invitation), Edwards A. Park, Baltimore (by invitation)

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, November 15, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. A case of congenital abnormality of a vertebra, Arthur H. Cilley

III. PAPER OF THE EVENING

Structural factors in static disorders of the foot, Dudley Morton (by invitation)

Discussion to be opened by Mather Cleveland

IV. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, November 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Tattooing of the cornea with platinum chloride, Mark J. Schoenberg
 - b. Lachrymal gland prolapse corrected by operation, James W. Smith
- III. DEMONSTRATION

Melanosis uveal and melanoma iris in Neurofibromatosis (Recklinghausen) (with lantern slides), Isadore Goldstein, David Dexler (by invitation)
- IV. PAPERS OF THE EVENING
 - a. Metabolism of sugar in the eye (with lantern slides), Francis Heed Adler, Philadelphia (by invitation)
 - b. Some practical points in tonometry, Martin Cohen
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF MEDICINE

Tuesday Evening, November 19, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Concentrate of pneumococcus serum, Lloyd D. Felton (by invitation)
 - b. Practical points in the administration of refined antipneumococcus serum, Russell L. Cecil
 - c. Types of pneumococci and methods of testing the potency of the serum, William H. Park
- II. DISCUSSION

Horace S. Baldwin, Lewis F. Frissell, Pol Coryllos

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, November 20, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING

Prospects of the prostatic, Edward L. Keyes
Discussion, Arthur L. Chute (by invitation), Benjamin S. Barringer, Edwin Beer, Henry G. Bugbee, Clyde Leroy Deming (by invitation), Oswald S. Lowsley, Joseph F. McCarthy, Alfred T. Osgood, Nathaniel P. Rathbun, John Sturdivant Read, Alexander R. Stevens
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, November 20, at 8:00 o'clock

(Please note change in date)

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. 1. Tic douloureux, for two years. Caldwell-Luc. Evulsion of infra-orbital branch and alcohol injection of peripheral branches. Scopolamin. Result, relief of pain for four years
2. Tic douloureux, for four years. Injection, relief of pain for three years
3. Sluder syndrome, upper half, headache for twenty-five years. Relieved by submucous resection, Jay D. Whitham (by invitation)
- b. Ocular motor paralysis. Duration, two months. Treated for lues, eight years ago. Sinusitis? R. L. H. Murphy (by invitation)
- c. 1. A case of encephalitis, with throat symptoms
2. A case of acute poliomyelitis, with double abductor paralysis. Tracheotomy. Recovery, Sylvester R. Leahy

III. DEMONSTRATION

- a. A palatal-palpebral reflex (motion pictures), C. J. Imperatori

IV. PAPERS OF THE EVENING

- a. Nerve block, Louis Gaston Labat (by invitation)
Discussion, John E. Mackenty, read by John M. Loré, Irving W. Voorhees, James J. King
- b. Neurology in its relation to rhinology, Israel Strauss
Discussion opened by Michael Osnato

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

NEW YORK SECTION OF THE

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Under the Auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday Evening, November 20, at 8:15 o'clock

- I. The form of dye penetrating the cell as determined by the glass electrode, Marian Irwin
- II. The isoelectric point of the Dick toxin, A. P. Kruegar, H. T. Tamada
Introduced by J. H. Northrop
- III. Rickets associated with normal concentration of Ca and Ph in the blood. Its failure to respond to treatment, A. F. Hess, M. Weinstock, H. Rivkin, J. Gross

- IV. Effect of adrenalectomy on experimental tuberculosis in the white rat, M. Steinbach
Introduced by F. P. Gay
- V. Antemortem basopenia as an index of resistance, A. E. Casey
Introduced by L. Pearce
- VI. Vitamin D in tuberculosis, Harold G. Grayzel, M. J. Shear, Benjamin Kramer

NEW YORK PATHOLOGICAL SOCIETY

Affiliated with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, November 21, at 8:30 o'clock
(Please note change in date)

ORDER

- I. PAPERS OF THE EVENING
- Postmortem chemistry of renal disease. One hundred cases, Silik H. Polayes (by invitation)
 - An unusual tumor of the spinal meninges. Case reports, Leila C. Knox
 - Changes in the intrahepatic bile ducts following cholecystectomy; an experimental study, John E. Sutton (by invitation)
 - Some observations on blood grouping, Arthur M. Tiber (by invitation)
 - A method for the study of bone marrow cytology, Abraham S. Gordon (by invitation)
 - Lymphosarcoma with involvement of the central nervous system, Charles Davison, Joseph J. Michaels (by invitation)
 - The Ascheim Zondek test for pregnancy. A study of 700 cases with demonstration of the test, Max Rosenzweig (by invitation)
 - Auricular dilatation, Edward A. Burkhardt, Jr. (by invitation)
- II. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, November 26, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF A FOLDING PESSARY
William M. Findley (by invitation)
Discussion, B. P. Watson
- III. CASE REPORTS
- Vaginal caesarean section with case report, Anthony Wollner (by invitation)
Discussion, H. C. Williamson, Arthur Stein

- b. Carcinoma of the cervix, complicating and associated with pregnancy. Indications for treatment and report of a case, Ira I. Kaplan

Discussion, H. C. Williamson, Samuel J. Scadron, James V. Ricci, Frederick C. Holden, Gerard L. Moench

- c. Further observations of the ante-partum diet in allergy of infants, Bret Ratner, Janet E. Greenbergh, B.A. (by invitation)

Discussion, Arthur Forrest Anderson (by invitation), Maximilian A. Ramirez

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

RESOLUTION OF THE COUNCIL AND STATED MEETING, DECEMBER, 1929

DEATH OF VICTOR C. VAUGHAN

Dr. Victor C. Vaughan, an Honorary Fellow of The New York Academy of Medicine, died on November 21, 1929. Dr. Vaughan was widely known in the United States as a chemist, pathologist, epidemiologist and hygienist. He was for over forty-five years connected with the Medical School of the University of Michigan, having worked in the departments of chemistry, physiology, therapeutics and hygiene.

An indefatigable worker in the laboratory, he published in the earlier days of chemistry important text books on physiological chemistry and proteins.

In the field of epidemiology, Dr. Vaughan's study of typhoid fever in the American army camps during the Spanish American War was a remarkable example of painstaking inquiry, which exposed the woeful lack of hygiene then existing in the American army. This remarkable investigation made in association with Reed and Shakespeare, paved the way toward the important reorganization of the methods employed by the Medical Corps of the Army, which produced such remarkable results during the Great War.

During a period of fifty years of active life, Dr. Vaughan was chemist, physiologist, pathologist, epidemiologist, teacher, soldier, scholar and scientist. He was a constant advisor in the fields of medical education, public health and preventive medicine, much beloved by his students and associates, and recognized throughout the United States and abroad as the most prominent scientist in the medical profession. Be it therefore

Resolved that The New York Academy of Medicine hereby records its deep sense of loss in the death of Dr. Victor C. Vaughan, an Honorary Fellow of this Institution, whose services to humanity have been of enormous benefit and whose example will always be inspiring to those engaged in the relief of suffering and the prevention of disease, and be it further

Resolved that a copy of this minute and resolution be published in the Bulletin of the Academy and sent to the members of his family.

DEATHS OF FELLOWS OF THE ACADEMY

RUDOLPH OTTO BORN, 1 West 85th Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1877; elected a Fellow of the Academy, March 3, 1887; died November 17, 1929. Dr. Born was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

NOTICE OF INDEX

The index for the year 1929 will be mailed with the January, 1930 number of the Bulletin.

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INDEX

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INDEX, 1929

AUTHORS

A

Annan, Miss G. L., Among our manuscripts, 869

B

Beers, Mr. Clifford, The origin and growth of the mental hygiene movement, 1031

Brooks, Harlow, Angina pectoris (abstract), 108

—, —, The Graduate Fortnight, 1027

—, —, The medicine of the American Indian, 509

Brown, T. R., Digestive problems (abstract), 117

Brown, W. L., The involuntary nervous system, 1035

Bullowa, J. G. M., Segmental hyperalgesia and segmental increased muscle tone in diseases of the lungs and heart, 538

—, —, The serum treatment and its evaluation in lobar pneumonia, 328

Burbank, Reginald, A study of the streptococcus in the etiology of arthritis, 176

C

Campbell, C. M., Hysteria as a practical problem, 1057

Cardozo, Judge Benjamin, What medicine can do for law, 581

Carlisle, R. J., Obituary, Dr. Reginald Hall Sayre, 807

Cecil, R. L., Arthritis and old age, 52

Child, C. M., Senescence and rejuvenescence from a biological standpoint (abstract), 111

Coca, A. F., Discussion, stated meeting of December 6, 1928, 250

—, —, The skin as a shock tissue, 223

Collins, Judge C. F., Medico-legal problems, 631

D

Delavan, D. B., The centenary of Johann Nepomuk Czermak, 440

Dickinson, R. L., Control of conception, present and future, 413

Donovan, D. J., Modern methods of resuscitation in New York City, 444

Duke, W. W., Allergy as encountered by the general practitioner, 939

E

Emerson, C. P., The importance of the emotions in the etiology and prognosis of disease, 985

Engelbach, William, Relation of endocrine disorders to senescence, 1

Ewing, James, Special aspects of neoplasms in the aged (abstract), 104

F

Farr, C. E., and Findlay, R. T., Salpingitis, 258

Findlay, R. T., see Farr, C. E., and Findlay, R. T., Salpingitis, 258

Fisher, Lewis, New vestibular complexes for localization of brain tumors (abstract), 554

Flexner, Simon, Serum protection and serum treatment of poliomyelitis (abstract), 252

G

- Garrison, F. H. Book review, The Osler catalogue, 860
 —, —, Developmental possibilities in medical history as a branch of the medical curriculum (editorial), 741
 —, —, Evil spoken of physicians and the answer thereto, The (editorial), 145
 —, —, History of drainage, irrigation, sewage-disposal and water supply, The (editorial), 305
 —, —, Medical tour in the west, A (editorial), 391
 —, —, Medicine as an agency in the advancement of science, art and civilization (editorial), 305
 —, —, Osleriana, The, 365
 —, —, Ramón y Cajal (editorial), 483

H

- Harris, T. J., History of post-graduate medicine in New York City, 789
 Hartwell, J. A., Academy, the profession and the public, The, 162
 Haviland, C. F., Social danger of the borderline mental case, 614
 Haynes, R. S., Unveiling of memorial tablet to Dr. Holt, 557

J

- Jennings, J. E., Address of welcome, 1025

K

- Kantor, J. L., The common affections of the colon, their origin and their management, 757
 Kennedy, Foster, Arterial diseases of the brain and cord, 19
 —, —, The rôle of the medical expert in criminal trials, 608
 Kereszturi, Camille, Preliminary report of oral B C G vaccination in New York City, on human beings (abstract), 435
 Klebs, A. C., An S. O. S. from Venice 380 years ago, 469

L

- Lambert, S. W., The Academy as an educational institution, 158
 Lee, B. J., and Stubenbord, J. G., A clinical index of malignancy for carcinoma of the breast, 188
 Lund, F. B., Allusions to medicine in classical literature, 845

M

- McAdoo, Hon. William, Discussion, Stated Meeting of March 7, 1929, 648
 McCarthy, J. F., Urology, its contacts with general medicine, 38
 MacTavish, W. C., Obituary, Professor John A. Mandel, 665
 Malloch, Archibald, A Fellow's special fund, 1076
 —, —, A magnificent gift of a collection on foods and cookery, 1074
 —, —, A volume on deposit and its owners, 865
 —, —, Some needs in medical bibliography, 1005
 Meleney, F. L., The importance of early diagnosis and early operation in hemolytic streptococcus gangrene (abstract), 552
 Miller, J. A., Lung abscess, some aspects of etiology and medical treatment, 268
 Moorhead, J. J., Traumatic surgery and the problems of age, 66
 Mosenthal, H. O., Hypertension (abstract), 107

P

- Pollitzer, Sigmund, Allergy in skin disease, 232

S

- Schweisheimer, W., To the great clinician Friedrich von Müller on his seventieth birthday, 363

- Smith, Theobald, Hideyo Noguchi 1876-1928, 877
 Stubenbord, J. G., see Lee, B. J., and Stubenbord, J. G., A clinical index of malignancy for carcinoma of the breast, 188

T

- Tandler, Prof. Dr. Julius, Public welfare in Vienna, 813

W

- Walzer, Abraham, Discussion, Stated Meeting of December 6, 1928, 243
 Watson, B. P., Menopausal and post-menopausal conditions in women, 25
 Welch, W. H., Hideyo Noguchi 1876-1928, 877
 White, F. W., Liver and biliary passages (abstract), 113
 Williams, C. M., Discussion, Stated Meeting of December 6, 1928, 246
 Williams, F. E., Discussion, Stated Meeting of March 7, 1929, 656
 Williams, L. R., Introduction, Catalogue of third annual exhibition of works in the plastic and graphic arts by American physicians, 298
 Wilmer, W. H., Diseases of the eye in old age, 76
 Wolfe, E. P., The genesis of the medical department of the United States Army, 823
 Wood, F. C., X-ray and radium in the problem of old age (abstract), 105

SUBJECTS

A

- Abscess, some aspects of etiology and medical treatment, Lung, J. A. Miller, 268
 Academy as an educational institution, The, S. W. Lambert, 158
 Academy meetings, Dates of, 143, 221, 391
 ———, Proceedings of, 138, 214, 293, 383, 475, 570, 1017, 1081
 Academy, the profession and the public, The, J. A. Hartwell, 162
 Accessions, Recent valuable, 276
 Accessions to the Library, Recent, 135, 212, 276, 381, 471, 564, 662, 805, 872, 979, 1014, 1077
 Acknowledgment of donation, 378, Acknowledgment of endowment, 378
 Addresses, Memorial, Hideyo Noguchi, 1876-1928, Theobald Smith, W. H. Welch, 877
 Address of the incoming president, The Academy, the profession and the public, J. A. Hartwell, 162
 Address of the retiring president, The Academy as an educational institution, S. W. Lambert, 158
 Address of welcome, J. E. Jennings, 1025
 Affections of the colon, their origin and their management, The common, J. L. Kantor, 757
 Afternoon lectures, Allergy as encountered by the general practitioner, W. W. Duke, 939
 ———, ———, Common affections of the colon, The, J. L. Kantor, 757
 ———, ———, Control of conception, present and future, R. L. Dickinson, 413
 ———, ———, Fourth series of, Committee on Medical Education, 467
 ———, ———, Friday, 1929-1930, 974
 ———, ———, Serum treatment and its evaluation in lobar pneumonia, The, J. G. M. Bullowa, 328
 Age, Arthritis and old, R. L. Cecil, 52
 Age, Catalogue of an exhibition of books, etc., on old, 119

- Age, Diseases of the eye in old, W. H. Wilmer, 76
 Age, X-ray and radium in the problem of old (abstract), F. C. Wood, 105
 Age, Traumatic surgery and the problems of, J. J. Moorhead, 66
 Aged, Special aspects of neoplasms in the (abstract), James Ewing, 104
 Allergy as encountered by the general practitioner, W. W. Duke, 939
 Allergy in skin diseases, Sigmund Pollitzer, 232
 Allusions to medicine in classical literature, F. B. Lund, 845
 American Indian, The medicine of the, Harlow Brooks, 509
 Angina pectoris (abstract), Harlow Brooks, 108
 Anniversary Discourse, What medicine can do for law, Judge Benjamin Cardozo, 581
 Announcements, 292
 Annual Graduate Fortnight, 1929, see Graduate Fortnight
 Annual meeting, January 3, 1929, Address of the incoming president, The Academy, the profession and the public, J. A. Hartwell, 162
 ——— ———, Address of the retiring president, The Academy as an educational institution, S. W. Lambert, 158
 ——— ———, A study of the streptococcus in the etiology of arthritis, Reginald Burbank, 176
 Army, The genesis of the medical department of the United States, E. P. Wolfe, 823
 Arterial diseases of the brain and cord, Foster Kennedy, 19
 Arthritis and old age, R. L. Cecil, 52
 Arthritis, A study of the streptococcus in the etiology of, Reginald Burbank, 176
 Arts by American physicians, Catalogue of third annual exhibition of works in the plastic and graphic, 298
 Aspects of neoplasms in the aged, Special (abstract), James Ewing, 104

B

- B C G vaccination in New York City, on human beings, Preliminary report of oral (abstract), Camille Kereszturi, 435
 Bequests, Form of, 221, 391
 Bibliography, Some needs in medical, Archibald Malloch, 1005
 Biliary passages, Liver and (abstract), F. W. White, 113
 Book Review, The Osler catalogue, F. H. Garrison, 860
 Borderline mental case, Social danger of the, C. F. Haviland, 614
 Brain and cord, Arterial diseases of the, Foster Kennedy, 19
 Brain tumors, New vestibular complexes for localization of (abstract), Lewis Fisher, 554
 Breast, A clinical index of malignancy for carcinoma of the, B. J. Lee and J. G. Stubenbord, 188
 Broadcasting, Medical, Council notes, 378

C

- Cajal, Ramón y (editorial), F. H. Garrison, 483
 Carcinoma of the breast, A clinical index of malignancy for, B. J. Lee and J. G. Stubenbord, 188
 Carpenter Lecture, The Wesley M., The importance of the emotions in the etiology and prognosis of disease, C. P. Emerson, 985.
 Catalogue of an exhibition of books, etc., on old age, 119
 Catalogue of an exhibition of medical manuscripts and incunabula, 278
 Catalogue of third annual exhibition of works in the plastic and graphic arts by American physicians, 298
 Catalogue, The Osler, Book Review, F. H. Garrison, 860
 Centenary of Johann Nepomuk Czermak, The, D. B. Delavan, 440
 Charities, Supervisory powers of the State Board of, 367

- Civil service of the city of New York, Classification of the medical positions under the municipal, 669
- Classical literature, Allusions to medicine in, F. B. Lund, 845
- Classification of the medical positions under the municipal civil service of the city of New York, 669
- Cleveland Medical Library Association, Some needs in medical bibliography, Archibald Malloch, 1005
- Clinical index of malignancy for carcinoma of the breast, A. B. J. Lee and J. G. Stubenbord, 188
- Colon, their origin and their management, The common affections of the, J. L. Kantor, 757
- Committee on Medical Education, Fourth series of afternoon lectures, 467
— — — — — Second Annual Graduate Fortnight, 211
- Committee on Professional Standards, 457
- Committee on Public Health Relations, Report on open hospitals in New York City, 197
— — — — — Resolution in honor of Dr. Dana, 375
— — — — — Supervisory powers of the State Board of Charities, 367
- Common affections of the colon, their origin and their management, The, J. L. Kantor, 757
- Complexes for localization of brain tumors, New vestibular (abstract), Lewis Fisher, 554
- Conception, present and future, Control of, R. L. Dickinson, 413
- Confidential records, Protection of patients', 461
- Cookery, A magnificent gift of a collection on foods and, Archibald Malloch, 1074
- Cord, Arterial diseases of the brain and, Foster Kennedy, 19
- Correction, 667, 876
- Council, Action of the, 578
- Council adopted October 30, 1929, Resolutions of the, 1023
- Council and stated meeting, December, 1929, Resolution of the, 1087
- Council, Excerpts from the minutes of the, 274
- Council notes, 378
- Criminal trials, The rôle of the medical expert in, Foster Kennedy, 608
- Curriculum, Developmental possibilities in medical history as a branch of the medical (editorial), F. H. Garrison, 741
- Czermak, The centenary of Johann Nepomuk, D. B. Delavan, 440

D

- Dana, Resolution in honor of Dr., 375
- Danger of the borderline mental case, Social, C. F. Haviland, 614
- Dates of Academy meetings, 143, 221, 391
- Deaths of Fellows of the Academy, 144, 220, 303, 389, 481, 579, 811, 886, 984, 1024, 1088
- | | |
|------------------------------|----------------------------------|
| Arnold, Ernst Hermann, 389 | Jackson, Victor Hugo, 303 |
| Bolling, Richard Walker, 481 | Jennings, Walter Barry, 303 |
| Born, Rudolph Otto, 1088 | Lawrence, George Alfred, 220 |
| Clark, Abram Schuyler, 389 | Losee, Joseph Rankin, 303 |
| Feldstein, Samuel, 984 | Lovell, Frederick Samuel, 303 |
| French, Thomas Rushmore, 220 | Luckett, William Henry, 811 |
| Glogau, Otto, 389 | Macdonald, George Alexander, 481 |
| Gorton, Orren Augustus, 389 | Mandel, John Alfred, 579 |
| Guntzer, John Henry, 886 | Murray, Francis Wisner, 481 |
| Hance, Irwin Howell, 984 | Pfeiffer, William, 144 |

- Sayre, Reginald Hall, 579, 1023
 Smyth, Herbert Edmund, 579
 Squibb, Edward Hamilton, 811
 Tuffier, Marin T., 1023
 Vaughan, Victor C., 1087
 Voorhees, James Ditmars, 886
 Deposit and its owner, A volume on, Archibald Malloch, 868
 Developmental possibilities in medical history as a branch of the medical curriculum (editorial), F. H. Garrison, 741
 Diagnosis and early operation in hemolytic streptococcus gangrene, The importance of early (abstract), F. L. Meleney, 552
 Digestive problems (abstract), T. R. Brown, 117
 Discourse, Anniversary, What medicine can do for law, Judge Benjamin Cardozo, 581
 Discussion, Stated Meeting of December 6, 1928, A. F. Coca, 250
 —, —, Abraham Walzer, 243
 —, —, C. M. Williams, 246
 —, —, March 7, 1929, Hon. William McAdoo, 648
 —, —, F. E. Williams, 656
 Disease, The importance of the emotions in the etiology and prognosis of, C. P. Emerson, 985
 Diseases, Allergy in skin, Sigmund Pollitzer, 232
 Diseases of the brain and cord, Arterial, Foster Kennedy, 19
 Diseases of the eye in old age, W. H. Wilmer, 76
 Diseases of the lungs and heart, Segmental hyperalgesia and segmental increased muscle tone in, J. G. M. Bullowa, 538
 Disorders to senescence, Relation of endocrine, William Engelbach, 1
 Donation, Acknowledgment of, 378
 Donations to the Library funds, 143, 221, 391
 Drainage, irrigation, sewage-disposal and water-supply, The history of, (editorial), F. H. Garrison, 887

E

- Early diagnosis and early operation in hemolytic streptococcus gangrene, The importance of (abstract), F. L. Meleney, 552
 Editorials, A medical tour in the west, F. H. Garrison, 391
 —, Developmental possibilities in medical history as a branch of the medical curriculum, F. H. Garrison, 741
 —, Evil spoken of physicians and the answer thereto, The, F. H. Garrison, 145
 —, History of drainage, irrigation, sewage-disposal and water-supply, The, F. H. Garrison, 887
 —, Medicine as an agency in the advancement of science, art and civilization, F. H. Garrison, 305
 —, Ramón y Cajal, F. H. Garrison, 483
 Educational institution, The Academy as an, S. W. Lambert, 158
 Emotions in the etiology and prognosis of disease, The importance of the, C. P. Emerson, 985
 Endocrine disorders to senescence, Relation of, William Engelbach, 1
 Endowment, Acknowledgment of, 378
 Etiology of arthritis, A study of the streptococcus in the, Reginald Burbank, 176
 Etiology and medical treatment, Lung abscess, some aspects of, J. A. Miller, 268
 Etiology and prognosis of disease, The importance of the emotions in the, C. P. Emerson, 985
 Evil spoken of physicians and the answer thereto, The (editorial), F. H. Garrison, 145

- Excerpts from the minutes of the Council, 274
 Exhibition of books, etc., on old age, Catalogue of an, 119
 Exhibition of medical manuscripts and incunabula, Catalogue of an, 278
 Exhibition of works in the plastic and graphic arts by American physicians, Catalogue of third Annual, 298
 Expert in criminal trials, The rôle of the medical, Foster Kennedy, 608
 Eye in old age, Diseases of the, W. H. Wilmer, 76

F

- Fellows elected, 220, 389, 480, 578, 984, 1022
 Fellow's special fund, A, Archibald Malloch, 1076
 Foods and cookery, A magnificent gift of a collection on, Archibald Malloch, 1074
 Foreign medical societies, Meetings of, 561
 Form of bequests, 221, 391
 Fortnight, Annual Graduate, 1929, see Graduate Fortnight
 Friday afternoon lecture series, see Afternoon lectures
 Fund, A Fellow's special, Archibald Malloch, 1076
 Funds, Donations to the Library, 143, 221, 391

G

- Gangrene, The importance of early diagnosis and early operation in hemolytic streptococcus (abstract), F. L. Meleney, 552
 Genesis of the medical department of the United States Army, The, E. P. Wolfe, 823
 Gift of a collection on foods and cookery, A magnificent, Archibald Malloch, 1074
 Graduate Fortnight, Annual, Address of welcome, John E. Jennings, 1025
 — —, Catalogue of an exhibition of books, etc., on old age, 562
 — —, The Graduate Fortnight, Harlow Brooks, 1027
 — —, Hysteria as a practical problem, C. M. Campbell, 1057
 — —, The involuntary nervous system, W. L. Brown, 1035
 — —, The origin and growth of the mental hygiene movement, Mr. Clifford Beers, 1031
 — —, The Wesley M. Carpenter Lecture, The importance of the emotions in the etiology and prognosis of disease, C. P. Emerson, 985
 — —, 119, 562, 661, 802, 864, 211
 Graduate medicine in New York City, History of post-, T. J. Harris, 789
 Growth of the mental hygiene movement, The origin and, Mr. Clifford Beers, 1031

H

- Heart, Segmental hyperalgesia and segmental increased muscle tone in diseases of the lungs and, J. G. M. Bullock, 538
 Hemolytic streptococcus gangrene, The importance of early diagnosis and early operation in (abstract), F. L. Meleney, 552
 History as a branch of the medical curriculum, Developmental possibilities in medical (editorial), F. H. Garrison, 741
 History of drainage, irrigation, sewage-disposal and water-supply, The, (editorial), F. H. Garrison, 887
 History of post-graduate medicine in New York City, T. J. Harris, 789
 Holt, Unveiling of memorial tablet to Dr., R. S. Haynes, 557
 Honor of Dr. Dana, Resolution in, 375
 Hospitals in New York City, Report on open, 197
 Hours during the summer, Library, 468, 807

- Human beings, Preliminary report of oral B C G vaccination in New York City, on (abstract), Camille Kereszturi, 435
- Hygiene movement, The origin and growth of the mental, Mr. Clifford Beers, 1031
- Hyperalgesia and segmental increased muscle tone in diseases of the lungs and heart, Segmental, J. G. M. Bullowa, 538
- Hypertension (abstract), H. O. Mosenthal, 107
- Hysteria as a practical problem, C. M. Campbell, 1057

I

- Importance of early diagnosis and early operation in hemolytic streptococcus gangrene, The, (abstract), F. L. Meleney, 552
- Importance of the emotions in the etiology and prognosis of disease, C. P. Emerson, 985
- Incoming president, Address of the, J. A. Hartwell, 162
- Increased muscle tone in diseases of the lungs and heart, Segmental hyperalgesia and segmental, J. G. M. Bullowa, 538
- Incunabula, Catalogue of an exhibition of medical manuscripts and, 278
- Index, 144
- Index of malignancy for carcinoma of the breast, A clinical, B. J. Lee and J. G. Stubenbord, 188
- Indian, The medicine of the American, Harlow Brooks, 509
- Institution, The Academy as an educational, S. W. Lambert, 158
- Involuntary nervous system, The, W. L. Brown, 1035
- Irrigation, sewage-disposal and water-supply, The history of drainage (editorial), F. H. Garrison, 887

L

- Law, What medicine can do for, Judge Benjamin Cardozo, 581
- Lectures, Fourth series of afternoon, Committee on Medical Education, 467
- Lectures, Friday afternoon 1929-1930, 974
- Library, Announcements, 292
- Library, Catalogue of an exhibition of medical manuscripts and incunabula, 278
- Library funds, Donations to the, 143, 221, 391
- Library hours during the summer, 468, 563, 665, 807
- Library notes,
 A Fellow's special fund, Archibald Malloch, 1076
 A magnificent gift of a collection on foods and cookery, Archibald Malloch, 1074
 Among our manuscripts, Miss G. L. Annan, 869
 An S. O. S. from Venice 380 years ago, Arnold C. Klebs, 469
 Visioning our periodicals, 803
 Volume on deposit and its owners, A. Archibald Malloch, 868
- Library, Recent accessions to the, 135, 212, 276, 381, 471, 564, 662, 805, 872, 979, 1014, 1077
- Library, Recent valuable accessions, 276
- Literature, Allusions to medicine in classical, F. B. Lund, 845
- Liver and biliary passages (abstract), F. W. White, 113
- Lobar pneumonia, The serum treatment and its evaluation in, J. G. M. Bullowa, 328
- Localization of brain tumors, New vestibular complexes for (abstract), Lewis Fisher, 554
- Lung abscess, some aspects of etiology and medical treatment, J. A. Miller, 268
- Lungs and heart, Segmental hyperalgesia and segmental increased muscle tone in diseases of the, J. G. M. Bullowa, 538

M

- Malignancy for carcinoma of the breast, A clinical index of, B. J. Lee and J. G. Stubenbord, 188
- Mandel, Professor John A., Obituary of, W. C. MacTavish, 665
- Manuscripts, Among our, Miss G. L. Annan, 869
- Manuscripts and incunabula, Catalogue of an exhibition of medical, 278
- Medical bibliography, Some needs in, Archibald Malloch, 1005
- Medical broadcasting, 378
- Medical department of the United States Army, The genesis of the, E. P. Wolfe, 823
- Medical Education, Committee on, Fourth series of afternoon lectures, 467
 —, —, Second Annual Graduate Fortnight, 211
- Medical expert in criminal trials, The rôle of the, Foster Kennedy, 608
- Medical history as a branch of the medical curriculum, Developmental possibilities in (editorial), F. H. Garrison, 741
- Medical manuscripts and incunabula, Catalogue of an exhibition of, 278
- Medical positions under the municipal civil service of the City of New York, Classification of the, 669
- Medical societies, Meeting of foreign, 561
- Medical tour in the west, A (editorial), F. H. Garrison, 391
- Medical treatment, Lung abscess some aspects of etiology and, J. A. Miller, 268
- Medicine as an agency in the advancement of science, art and civilization (editorial), F. H. Garrison, 305
- Medicine can do for law, What, Judge Benjamin Cardozo, 581
- Medicine in classical literature, Allusions to, F. B. Lund, 845
- Medicine in New York City, History of post-graduate, T. J. Harris, 789
- Medicine of the American Indian, The, Harlow Brooks, 509
- Medicine, Urology, its contacts with general, J. F. McCarthy, 38
- Medico-legal problems, Judge C. F. Collins, 631
- Meetings, Dates of Academy, 143, 221, 391
- Meetings of foreign medical societies, 561
- Meetings, Proceedings of Academy, 138, 214, 293, 383, 475, 570, 1017, 1081
- Memorial addresses: Hideyo Noguchi 1876-1928, Theobald Smith, William H. Welch, 877
- Memorial tablet to Dr. Holt, Unveiling of, R. S. Haynes, 557
- Menopausal and post-menopausal conditions in women, B. P. Watson, 25
- Mental case, Social danger of the borderline, C. F. Haviland, 614
- Mental hygiene movement, The origin and growth of the, Mr. Clifford Beers, 1031
- Minutes of the Council, Excerpts from, 274
- Modern methods of resuscitation in New York City, D. J. Donovan, 444
- Movement, The origin and growth of the mental hygiene, Mr. Clifford Beers, 1031
- Müller on his seventieth birthday, To the great clinician Friedrich von, W. Schweisheimer, 363
- Muscle tone in diseases of the lungs and heart, Segmental hyperalgesia and segmental increased, J. G. M. Bullowa, 538
- Methods of resuscitation in New York City, Modern, D. J. Donovan, 444

N

- Needs in medical bibliography, Some, Archibald Malloch, 1005
- Neoplasms in the aged, Special aspects of (abstract), James Ewing, 104
- Nervous system, The involuntary, W. L. Brown, 1035
- New vestibular complexes for localization of brain tumors (abstract), Lewis Fisher, 554
- New York City, Report on open hospitals in, 197

Noguchi, Hideyo 1876-1928, Memorial addresses, Theobald Smith, William H. Welch, 877
 Notice, 303, 1013

O

Obituary Dr. Reginald Hall Sayre, R. J. Carlisle, 807
 Obituary Professor John A. Mandel, W. C. MacTavish, 665
 Old age, Arthritis and, R. L. Cecil, 52
 Old age, Diseases of the eye in, W. H. Wilmer, 76
 Old age, X-ray and radium in the problem of (abstract), F. C. Wood, 105
 Open hospitals in New York City, Report on, 197
 Operation in hemolytic streptococcus gangrene, The importance of early diagnosis and early (abstract), F. L. Meleney, 552
 Oral B C G vaccination in New York City, on human beings, Preliminary report of (abstract), Camille Kereszturi, 435
 Origin and growth of the mental hygiene movement, The, Mr. Clifford Beers, 1031
 Osler catalogue, The, Book Review, F. H. Garrison, 860
 Osleriana, F. H. Garrison, 365
 Owners, A volume on deposit and its, Archibald Malloch, 865

P

Passages, Liver and biliary (abstract), F. W. White, 113
 Patients' confidential records, Protection of, 461
 Pectoris, Angina (abstract), Harlow Brooks, 108
 Periodicals, Visioning our, 803
 Physicians and the answer thereto, The evil spoken of (editorial), F. H. Garrison, 145
 Pneumonia, The serum treatment and its evaluation in lobar, J. G. M. Bullowa, 328
 Poliomyelitis, Serum protection and serum treatment of (abstract), Simon Flexner, 252
 Positions under the municipal civil service of the City of New York, Classification of the medical, 669
 Possibilities in medical history as a branch of the medical curriculum, Developmental (editorial), F. H. Garrison, 741
 Post-graduate medicine in New York City, History of, T. J. Harris, 789
 Post-menopausal conditions in women, Menopausal and, B. P. Watson, 25
 Powers of the State Board of Charities, Supervisory, 367
 Practitioner, Allergy as encountered by the general, W. W. Duke, 939
 Preliminary report of oral B C G vaccination in New York City, on human beings (abstract), Camille Kereszturi, 435
 Present and future, Control of conception, R. L. Dickinson, 413
 President, Address of the incoming, J. A. Hartwell, 162
 President, Address of the retiring, S. W. Lambert, 158
 Presidential address at the Thirty-Second Annual Meeting of the Medical Library Association, Archibald Malloch, 1005
 Problems, Medico-legal, Judge C. F. Collins, 631
 Proceedings of Academy meetings, 138, 214, 293, 383, 475, 570, 1017, 1081
 Profession and the public, The Academy, the, J. A. Hartwell, 162
 Professional Standards, Committee on, 457
 Prognosis of disease, The importance of the emotions in the etiology and, C. P. Emerson, 985
 Protection and serum treatment of poliomyelitis, Serum (abstract), Simon Flexner, 252
 Protection of patients' confidential records, 461

- Public Health Relations Committee, Classification of the medical positions under the municipal civil service of the City of New York as recommended by The, 669
- —, Resolution in honor of Dr. Dana, 375
- —, Supervisory powers of the State Board of Charities, 367
- —, Report on open hospitals in New York City, 197
- Public, The Academy, The profession and the, J. A. Hartwell, 162
- Public welfare in Vienna, Prof. Dr. Julius Tandler, 813

R

- Radium in the problem of old age, X-ray and (abstract), F. C. Wood, 105
- Recent accessions to the Library, 135, 212, 276, 381, 471, 564, 662, 805, 872, 979, 1014, 1077
- Records, Protection of patients' confidential, 461
- Rejuvenescence from a biological standpoint, Senescence and (abstract), C. M. Child, 111
- Relation of endocrine disorders to senescence, William Engelbach, 1
- Report of oral B C G vaccination in New York City, on human beings, Preliminary (abstract), Camille Kereszturi, 435
- Report on open hospitals in New York City, 197
- Resolution in honor of Dr. Dana, 375
- Resolution of the Council and stated meeting, December, 1929, 1087
- Resolution of the Council, Acknowledgment of endowment, 378
- —, Acknowledgment of donation, 378
- —, Medical broadcasting, 378
- —, on the death of Dr. Widal, 379
- Resolutions of the Council adopted October 30, 1929, 1023
- Resolutions passed at the stated meeting of February 7, 1929, 196
- Resuscitation in New York City, Modern methods of, D. J. Donovan, 444
- Retiring president, Address of the, S. W. Lambert, 158
- Rôle of the medical expert in criminal trials, The, Foster Kennedy, 608

S

- Salpingitis, C. E. Farr and R. T. Findlay, 258
- Sayre, Dr. Reginald Hall, Obituary, R. J. Carlisle, 807
- Second Annual Graduate Fortnight, see Graduate Fortnight
- Section meetings,
- Dermatology and Syphilis
- Allergy in skin diseases, Sigmund Pollitzer, 232
- Discussion, A. F. Coca, 250
- , Abraham Walzer, 243
- , C. M. Williams, 246
- The skin as a shock tissue, A. F. Coca, 223
- Historical and Cultural Medicine
- Allusions to medicine in classical literature, F. B. Lund, 845
- Genesis of the medical department of the United States Army, The, E. P. Wolfe, 823
- The Medicine of the American Indian, Harlow Brooks, 509
- Laryngology and Rhinology, and Medicine
- Lung abscess, some aspects of etiology and medical treatment, J. A. Miller, 268
- Medicine
- Modern methods of resuscitation in New York City, D. J. Donovan, 444
- Serum protection and serum treatment of poliomyelitis (abstract), Simon Flexner, 252

Neurology and Psychiatry

Medico-legal problems, Judge C. F. Collins, 631

The rôle of the medical expert in criminal trials, Foster Kennedy, 608

Segmental hyperalgesia and segmental increased muscle tone in diseases of the lungs and heart, J. G. M. Bullowa, 538

Social danger of the borderline mental case, C. F. Haviland, 614

Otology

New vestibular complexes for localization of brain tumors (abstract), Lewis Fisher, 554

Pediatrics

Preliminary report of oral B C G vaccination in New York City, on human beings, Camille Kereszturi, 435

Unveiling of memorial tablet to Dr. Holt, R. S. Haynes, 557

Surgery

A clinical index of malignancy for carcinoma of the breast, B. J. Lee and J. G. Stubenbord, 188

The importance of early diagnosis and early operation in hemolytic streptococcus gangrene (abstract), F. L. Meleney, 552

Salpingitis, C. E. Farr and R. T. Findlay, 258

Segmental hyperalgesia and segmental increased muscle tone in diseases of the lungs and heart, J. G. M. Bullowa, 538

Senescence and rejuvenescence from a biological standpoint (abstract), C. M. Child, 111

Senescence, Relation of endocrine disorders to, William Engelbach, 1

Serum protection and serum treatment of poliomyelitis (abstract), Simon Flexner, 252

Serum treatment and its evaluation in lobar pneumonia, The, J. G. M. Bullowa, 328

Sewage-disposal and water-supply, The history of drainage, irrigation (editorial), F. H. Garrison, 887

Skin as a shock tissue, The, A. F. Coca, 223

Skin diseases, Allergy in, Sigmund Pollitzer, 232

Social danger of the borderline mental case, C. F. Haviland, 614

Societies, Meetings of foreign medical, 561

S. O. S. from Venice 380 years ago, An, A. C. Klebs, 469

Special fund, A Fellow's, Archibald Malloch, 1076

Standards, Committee on Professional, 457

State Board of Charities, Supervisory powers of the, 367

Stated meeting, December, 1929, Resolution of the Council and, 1087

Stated meeting of February 7, 1929, Resolutions passed at, 196

Streptococcus gangrene, The importance of early diagnosis and early operation in hemolytic (abstract), F. L. Meleney, 552

Streptococcus in the etiology of arthritis, A study of the, Reginald Burbank, 176

Supervisory powers of the State Board of Charities, 367

Surgery and the problems of age, Traumatic, J. J. Moorhead, 66

T

Tablet to Dr. Holt, Unveiling of memorial, R. S. Haynes, 557

Tissue, The skin as a shock, A. F. Coca, 223

Tour in the west, A medical (editorial), F. H. Garrison, 391

Traumatic surgery and the problems of age, J. J. Moorhead, 66

Treatment and its evaluation in lobar pneumonia, The serum, J. G. M. Bullowa, 328

Treatment, Lung abscess, some aspects of etiology and medical, J. A. Miller, 268

SUBJECTS

1103

- Treatment of poliomyelitis, Serum protection and serum (abstract), Simon Flexner, 252
Trials, The rôle of the medical expert in criminal, Foster Kennedy, 608
Tuffier, Marin T., Resolutions of the Council adopted October 30, 1929, 1023
Tumors, New vestibular complexes for localization of brain (abstract), Lewis Fisher, 554

U

- United States Army, The genesis of the medical department of the, E. P. Wolfe, 823
Unveiling of memorial tablet to Dr. Holt, R. S. Haynes, 557
Urology, its contacts with general medicine, J. F. McCarthy, 38

V

- Vaccination in New York City, on human beings, Preliminary report of oral B C G (abstract), Camille Kereszturi, 435
Valuable accessions, Recent, 276
Vaughan, Victor C., Resolution of the Council and stated meeting, December, 1929, 1087
Venice 380 years ago, An S. O. S. from, A. C. Klebs, 469
Vestibular complexes for localization of brain tumors, New (abstract), Lewis Fisher, 554
Vienna, Public welfare in, Prof. Dr. Julius Tandler, 813
Visioning our periodicals, 803
Volume on deposit and its owner, A, Archibald Malloch. 868

W

- Water-supply, The history of drainage, irrigation, sewage-disposal and (editorial), F. H. Garrison, 887
Welcome, Address of, J. E. Jennings, 1025
Welfare in Vienna, Public, Prof. Dr. Julius Tandler, 813
West, A medical tour in the (editorial), F. H. Garrison, 391
Widal, Georges Fernand Isidore, Resolution of the Council on the death of Dr., 379
Women, Menopausal and post-menopausal conditions in, B. P. Watson, 25

X

- X-ray and radium in the problem of old age (abstract), F. C. Wood, 105



FIGURE 8

tive new-growth is excluded. Increased gas content of the large intestine is likewise suggestive of colitis.

Prognosis.—The outlook for the absolute cure of colitis is often so uncertain that the prognosis must be guarded. However, it is equally true that some patients can be cured, and many, if not most, can be relieved of their symptoms. In every case, nevertheless, the treatment must be exceedingly painstaking and long-continued, as the underlying autonomic instability is a difficult, if not an impossible matter to eradicate. Many cases still go unrecognized, and are, therefore, either improperly or insufficiently treated.

GENERAL PRINCIPLES OF PROPHYLAXIS AND TREATMENT

Before beginning any active interference, a complete and careful survey is indispensable. Perhaps the first step in therapy is the absolute withdrawal of all forms of colonic abuse (cathartics, enemas, irrigations) so frequently indulged in by these patients.

In general, it may be said that the prophylaxis and treatment of colonic irritability are dominated by the neurotic nature of this affliction. Every effort should be made to preserve or restore autonomic stability. To this end, the special hygienic problems of each case must be ascertained, and a sensible program outlined with particular emphasis on work, sleep, rest, and recreation. The emotional life of the patient should be controlled as much as possible, since many attacks of colitis are distinctly associated with psychic trauma. In all cases, rest is important; and complete bed rest may well be prescribed for all debilitated subjects. Exposure to cold and wet is distinctly harmful, and must be avoided. Excess of roughage must be eliminated from the diet, and iced foods and drinks should be used, if at all, with great caution.

Diet.—The dietetic treatment of simple colitis is essentially conservative and protective in nature. The food should be as non-irritating as possible—hence all coarse vegetable fiber must be particularly excluded. On the other hand, to make up for this deficit and to supply enough “frame-work” for the fecal column to ensure adequate peristalsis, relatively large amounts of bland and bulky but wholly nonabsorbable salts have been found most useful. These will be described in detail later.

The bland diet for the irritable colon differs from that for gastric irritation in two particulars. Milk is to be avoided or else reduced to a minimum, as in many cases, it greatly increases gas formation and gas distress. Meat, on the other hand, is generally well tolerated, and may be given from the start in large amounts. A well-balanced diet is secured by a modification of the standard Schmidt

Summarising the evidence that characterizes this specific atopic type of atopic eczema, we have first, hereditary history of sensitivity, either past or present, in the patient or familial; secondly, positive skin tests—only in cases due to foods or other proteins, such as milk. In drug sensitive cases the skin tests are of no value; thirdly, previous history or present involvement of other organs with atopic disturbance, *i.e.*, cases of atopic eczema with associated hay fever, asthma, etc., or a previous history of such diseases in the patient.

CONCLUSIONS: Disregarding parasitic or other eczemas of obvious external origin, every case of real eczema, especially in children with a definite atopic history, should be considered as atopic first until proven the contrary.

CHARLES MALLORY WILLIAMS: The previous speakers have dealt with this subject principally from the point of view of inheritance and positive sensitization. After a few comments and questions I hope to take up a somewhat different aspect. I understand from Dr. Coca that sensitization, or rather this atopic sensitivity, which results in hay fever and asthma in many individuals and in others in acute urticaria is due to the presence in the blood of some substance which he calls reagin, and that development of this substance is inherited somewhat after the manner of a Mendelian dominant, and that there are figures which show this. I would like to know whether this substance is specific. If it is not, I would ask if it is true or demonstrated that such an individual will react to all of the pollens or substances known to produce asthma and hay fever and, if not, what is the explanation? I have not gone into this and would like to know. It is the presence of this substance which causes reaction which occurs in these sensitive people after ingestion of certain articles of food, because the experiments seem to show that many

proteins are absorbed through the intestinal wall unchanged and are found circulating in the blood of normal individuals, and this, without the presence of reagins, will not produce symptoms. In other words, the presence of reagins is the essential factor of the disease. This would be a very essential advance. Urticaria of course is the disease we all think of in this connection and I was very glad to hear Dr. Walzer make the statement that the origins of urticaria are multiple. The disease owes its name to the symptom caused by external contact with stinging nettle which may be a specific immunological reaction but, somehow, I doubt it. The jelly fish will also produce it. The common cause is by ingestion of certain articles of food, notably strawberries and shell fish. That is the line on which urticaria is usually attacked. I think everyone who has had much experience with dermatology has found many individuals will keep on having urticaria in spite of any food which may be given; they may have milk for a week and nothing else and still have urticaria, and boiled rice for a week and still have urticaria. In other words, we must seek further for the cause of urticaria and what we find here, I think, will probably vary in different cases. Of course at the present time we are very fond of invoking the endocrines and say the suprarenals are out of order, which may or may not be the case. I have seen one case of urticaria with angioneurotic symptoms seemingly dependent on a run down condition, for example, a woman had just given birth to a child, was anemic and neurotic; she was not cured by careful regulation of diet but by hearty feeding, outdoor life and getting her in good health. I believe other cases are due to some focus of infection. There are cases reported of urticaria due to syphilis, but these are exceedingly rare. I believe some cases are due to some bacterial toxin just as we find many cases of erythema are undoubtedly toxic in origin.

Dr. Pollitzer paid his respects to the skin tests and I must say I have had the same experience. They never helped me in practice. The climax to this is reached by room dust; what is there less specific than room dust? It